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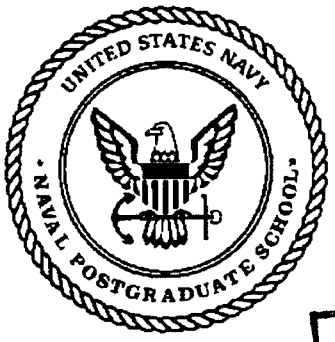

THESIS

CONTRACTOR PERSPECTIVE OF MULTIYEAR CONTRACTING FOR MAJOR SYSTEM ACQUISITIONS

by

Richard Frank Gonzalez

December, 1994

Principal Advisor: Sandra M. Desbrow

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Multiyear contracting has largely fallen out of favor due to an inability to quantify savings, Congressional reluctance to commit appropriations for greater than one year and the restrictive nature of cancellation ceilings. Previous studies of multiyear contracting have concentrated on advantages to the Government and neglected the needs and motivation of industry. This study examines the perspective of prime contractors awarded a major system multiyear contract from 1985 to 1991. A survey was conducted to obtain the contractor perspective, counterbalanced with responses from the Government program offices which administered the contracts. This study concluded that: contractors desire a greater say in what programs are selected for multiyear; successful programs, as often as not, still contain an element of instability; contractors believe compensation for risk undertaken is not entirely adequate; and savings from multiyear are potentially greater but still derived entirely from economic order quantity purchases.

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CONTRACTOR PERSPECTIVE OF MULTIYEAR CONTRACTING FOR MAJOR SYSTEM ACQUISITIONS

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Submitted in partial fulfillment
of the requirements for the degree of

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ABSTRACT

Multiyear contracting has largely fallen out of favor due to an inability to quantify savings, Congressional reluctance to commit appropriations for greater than one year and the restrictive nature of cancellation ceilings. Previous studies of multiyear contracting have concentrated on advantages to the Government and neglected the needs and motivation of industry. This study examines the perspective of prime contractors awarded a major system multiyear contract from 1985 to 1991. A survey was conducted to obtain the contractor perspective, counterbalanced with responses from the Government program offices which administered the contracts. This study concluded that: contractors desire a greater say in what programs are selected for multiyear; successful programs, as often as not, still contain an element of instability; contractors believe compensation for risk undertaken is not entirely adequate; and savings from multiyear are potentially greater but still derived entirely from economic order quantity purchases.

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I. INTRODUCTION

A. BACKGROUND

If there is one constant in acquisition it is the incessant need of the profession to reinvent itself, to discover the method that will optimally achieve the lowest cost, most efficient production with the greatest inherent quality. During the last cycle of acquisition reform generated in the early 1980's, multiyear contracting was seen by some as just such a concept.

Multiyear contracting is not new having emerged first in the early 1960's and gone through three distinct phases in the intervening years. The first phase was a rush to embrace the process followed quickly by a second in the early 1970's that greatly restricted its use. The third and most recent began in 1981 when then Deputy Secretary of Defense, Frank Carlucci, made multiyear contracting a major emphasis of his Acquisition Improvement Program. One of the primary goals of the Acquisition Improvement Program was to spend defense dollars more efficiently to aid in the rapid buildup of military forces during the Reagan Administration. [Ref. 1:p. 20]

Advocates of multiyear contracting have focused on the beneficial cost savings to the Government which encouraged contractors to use economies of scale. Subsequent efforts and studies on multiyear contracting sought to quantify those savings. Contractor concerns were assumed to mirror those of the Government with benefits realized by both parties. Yet, little hard data were produced to empirically demonstrate the effects multiyear contracting had on contractor business practices.

A study conducted in 1982 by Steven Bergjans and Lawrence Elbroch quite by accident uncovered a portion of the undercurrent of contractor concerns with multiyear contracting [Ref. 2:p. 154-155]. Bergjans and Elbroch's study was conducted to validate benefits of multiyear contracting to the

Department of Defense only. During interviews with contractors asked to participate in answering questions concerning the theoretical outcome of multiyear procurement, one of their sources outlined the contractor concerns which were not properly being addressed by any study. These concerns and issues were concentrated in six areas:

1) Minimization of Risk
2) Amortization of Investment Costs
3) Program Selection
4) Cancellation Liability
5) Acquisition Regulations
6) Profit Erosion

Dissatisfaction with Government contract procedures is well-documented. The majority of contractor complaints concerning the procurement process come from the pre-award phase [Ref. 3:p. 89-92]. Neither the Bergjans and Elbroch study nor subsequent research in the area of multiyear contracting were conducted to gauge the magnitude of these contractor concerns. It is quite conceivable that this dissatisfaction may be in part due to a perceived lack of interest by Government officials for contractor concerns. The need to understand the depth of contractor concerns is paramount if multiyear contracting, as well as other acquisition reform efforts, are to succeed in their intended purpose.

B. RESEARCH OBJECTIVE

The primary objective of this research is to determine the influence, both intended and unintended, on contractor business practices of the award of a multiyear contract for a major system acquisition by understanding contractor concerns when generated by such an award. A highly specialized form of contracting, multiyear contracting has most often been associated with the acquisition of major defense programs. While theoretically conveying many beneficial effects on both

the Government and industry, the exact nature of those benefits has been difficult to empirically establish. This thesis will investigate these influences on contractor production from a contractor's point of view by examining the impact of actual multiyear contracts. One of the goals is to determine if the postulated benefits are real or any greater than that which could have been achieved using annual year contracting. The downsizing of the Armed Services makes the existence of new major acquisition programs unlikely to occur any time soon. Objective lessons gleaned from the use of multiyear contracting during the military buildup of the 1980's must be preserved and codified before they are forgotten. With acquisition reform being a major emphasis of the current Administration, understanding the successes and failures of previous methods touted as major improvements in acquisition takes on a new urgency. If understood correctly, multiyear contracting's positive gains can be applied to other more mundane acquisitions to enhance efficiency.

C. RESEARCH QUESTION

The following primary research question will be used to direct and guide the objectives of this study:

What is the contractor perspective on how the Department of Defense (DoD) has used multiyear contracting for the acquisition of major systems?

This primary research question can be divided into a number of smaller subsidiary research questions to make investigation more manageable. The following will be used in this study:

1) What are the advantages and disadvantages of multiyear contracting?
2) How do contractors and the Government respond to differences between annual year and multiyear contracting?
3) What do contractors perceive as desirable

characteristics of a multiyear contract?

4) What application does multiyear contracting have in current acquisition reform efforts?

D. SCOPE, LIMITATIONS, AND ASSUMPTIONS

The scope of this thesis is bounded by the interaction of multiyear contracting upon contractor business practices. Background information will consist of general information and research in multiyear contracting. Other issues will be explored only to the extent that they shed light on multiyear contracting. A survey of all multiyear contracting issues and problems is not the intent of this thesis but only those which might concern a contractor. The primary focus is upon the period from 1985, the start of the last phase of the most recent acquisition reform effort, through the end of 1991, the end of the military buildup initiated during the Reagan-Bush Administrations. Those multiyear contracting candidates requiring Congressional approval, or major system acquisition programs, formed the pool from which participants were selected for this study. Individual contracts were not examined. An empirical effort to determine the reliability of information received from contractors was not undertaken since the perception of truth is probably the most important part of future contractor motivation. However, an attempt to balance perspectives was sought by sending the same questionnaire to Government program offices administering major systems contracts. Convergence of opinions between contractors and Government program offices will be assumed to approximate the truth. Divergence of opinions will indicate problem areas in need of future research.

The primary limitations on this study are the time period covered and the type of acquisition effort. Lessons derived from a six-year contracting window on major system acquisitions may not have applicability to other acquisition efforts. The focus of this study was narrowed to these two

factors primarily due to the availability of information. Another limitation is the small sample size (approximately 30 contractors and 30 Government program offices) from which a response is to be elicited which may limit usefulness to infer broader lessons.

Several assumptions were made in this study. The first was that participants to whom questionnaires were mailed were qualified or authorized to provide the information for their organizations. The second was that respondents provided honest and unbiased answers as a result of keeping their identities confidential. The third assumption was that participants as well as readers of this study are familiar with Government procurement practices and procedures. Underlying all these others was a fourth assumption that information obtained from this study could be extrapolated to other multiyear contracting scenarios not involving major system acquisitions.

E. METHODOLOGY

The methodology used by the researcher consisted of two basic procedures: (1) review of pertinent literature, and (2) the use of a questionnaire to elicit information on questions produced by the literature review. The comprehensive review of relevant outstanding literature on multiyear contracting consisted of obtaining reports held by the Naval Postgraduate School, the Defense Logistics Studies Information Exchange (DLSIE), and the Defense Technical Information Center (DTIC) as well as applicable professional journals. From these data, the researcher developed a survey to probe those areas containing contradictory information or subjects deemed of most interest to contractors.

The survey was administered to contractors mentioned in conjunction with major defense acquisition programs nominated to Congress for multiyear contracts between 1985 and 1991. The goal was to assess the impact of multiyear contracting on

contractor business practices, personnel, competitiveness and investment in facilities. Questions focused on the appropriateness of items selected for multiyear contracting, termination liabilities, risk, investment, subcontractor utilization and the industrial base. To balance contractor responses and act as a baseline for comparison, the perceptions of Government program offices were also solicited. The same survey was sent to Government program offices to determine if lessons learned from multiyear contracting were perceived the same way.

Upon receipt of data, analysis was conducted using appropriate measures to investigate variations. Responses consisted, in the most part, of qualitative vice quantitative data. Because most data were either ordinal or nominal, non-parametric means were used to compare data and draw conclusions.

F. THESIS ORGANIZATION

This research effort is comprised of five chapters covering the following subject areas:

Chapter I is an introduction providing the rationale and objective to be obtained in this study.

Chapter II presents information on multiyear contracting gleaned from a comprehensive review of outstanding literature. History, advantages, disadvantages and current policies will be discussed. Information in this chapter will also focus on items pertinent to the questionnaire as well as influences on the scope and limitations imposed on this study.

Chapter III discusses the methodology used for this study and the rationale for the selection of the participants in this study. A brief description of the research design and problems associated with the questionnaire method of research will be discussed.

Chapter IV will present the data collected for this study from completed, returned questionnaires. This Chapter will

examine the structure of the questionnaire and respondent background information.

Chapter V will continue the presentation of information with an emphasis on program selection, contractor investment in facilities, and program stability. An interpretation and evaluation of the data collected will be presented.

Chapter VI will examine subcontractor participation in multiyear contracting as well as the conduct of the actual contract and risk. Implications and ramifications will be presented.

Chapter VII will conclude the data analysis with an examination of written comments on multiyear contracting.

Chapter VIII will present conclusions and recommendations drawn from the data collected. An emphasis will be placed on how this information may be used to encourage the greater use of multiyear contracting. Application to current acquisition reform efforts will be made where appropriate. Areas for further research will also be discussed.

G. CHAPTER SUMMARY

This chapter provided an overview of the purpose and objectives to be investigated in this study. Chapter II will provide a more in-depth review of research literature pertaining to multiyear contracting.

II. BACKGROUND

A. INTRODUCTION

Multiyear contracting casts an appeal that finds nearly universal acceptance with all contracting professionals. The literature is replete with examples of what multiyear contracting can do for both the Government and commercial enterprises.

Commercial industry continues to find favor with long-term relationships. The Deming Management philosophy, increasingly popular in this country after transforming an economically prostrate Japan, recognizes the importance of business relationships that last for several years. Point four of Deming's "Fourteen Points" of business improvement advocates the end of awarding contracts based on price alone. Suppliers are encouraged to work toward establishing long-term relationships to achieve a continuous level of quality and productivity improvement [Ref. 4:p. 62-65]. Like Adam Smith's invisible hand, the Deming philosophy proves that by pursuing one's own long-term best interests benefits accrue to all parties to a transaction. Another manifestation of this long-term relationship is found in the Just-In-Time (JIT) process. The JIT philosophy requires that suppliers become an extension of the buyer's organization [Ref. 5:p. 16-17]. It is a given that to work properly the relationship must be long term. When queried about such relationships, industry unhesitantly voices approval by pursuing them whenever possible. A 1992 survey conducted by a professional purchasing magazine, found 79% of companies responding had created long-term relationships with their suppliers [Ref. 6:p. 50]. Another survey conducted in 1993 found 92% of industry respondents desired the greater use of long-term contracts [Ref. 7:p. 71].

Government interest in long-term relationships embodied in multiyear contracting has not been as consistent as that of industry. In the early 1980's, multiyear contracting was

generally considered essential for acquisition reform [Ref. 8: p.24]. By the mid 1990's, this was no longer true. The executive summary of the Section 800 Panel Report on Streamlining and Codifying Acquisition Laws does not contain a single entry on the subject. In studies and research literature on multiyear contracting held in the Defense Logistic Studies Information Exchange (DLSIE) data base shown in Table 2.1, a striking decline in interest is noticeable. It is as if a palpable disappointment in multiyear contracting has come over the DoD contracting community relegating it to obscurity as a concept unworkable in a declining or unstable budget environment.

DLSIE RESEARCH REFERENCES ON MULTIYEAR CONTRACTING					
Years	1960-69	1970-79	1980-84	1985-89	1990-94
Studies	14	15	57	31	6

Table 2.1

The facts surrounding multiyear contracting, separate from its fiction, have often been difficult to discern. Inherent advantages and disadvantages have always been obscured by the hyperbole and motive of the messenger instead of being judged on merit alone. Yet, if the concept were not valid, businesses would not continue to agitate for its adoption. Multiyear as practiced by Federal activities has been inextricably linked to specific events that often color its reception.

B. HISTORY OF MULTIYEAR CONTRACTING

The genesis of current multiyear contracting efforts can be traced to the early 1960's. The Army used multiyear to provide material support for reoccurring items used at its many bases to avoid problems with the annual budget. A series of successful contracts ranging from five ton trucks to flamethrowers encouraged the expansion and application of the

technique to other items [Ref. 9:p. 2-3]. By 1967, multiyear had been expanded for use with long-term material and maintenance service contracts. Also in this year Congress, concerned with its loss in budget flexibility that multiyear implied, restricted the use of multiyear for service contracts to areas outside the continental United States [Ref. 10:p. 5]. Multiyear was limited to production contracts for weapons of proven stability. When expanded to include major weapon systems costs through a system of total package procurement, greater dollars were put at risk from employing cutting edge technology paired with heightened cancellation charges. The very magnitude of those dollars committed ensured that subsequent policy for all multiyear contracting would be influenced by the outcome of major system contracts.

In the late 1960's, the Navy decided to use multiyear for its DD-963 and LHA-1 shipbuilding programs. The majority of multiyear contracts, despite guidance to the contrary, did not contain fully-funded cancellation ceilings. The DD-963 class ships suffered numerous delays but no cancellations unlike the LHA-1 program. After numerous engineering change requests, years four and five of the LHA-1 multiyear contract were terminated in 1972. The LHA contract contained a cancellation ceiling provision providing for a $109.7 million payment on a $1.67 billion program [Ref 11:III-18 to 19]. Because this cancellation charge had not been funded, Congress was forced to enact special legislation to provide payment owed the contractor under the terms of the contract. This drew a firestorm of criticism from Congress which quickly moved to rectify an oversight in the regulations that might compromise its fiscal control. For the first time, but not the last, multiyear contracting procedures were modified and restricted due to problems encountered in its use.

Congress adopted additional restrictions on multiyear with the passage of the Defense Authorization Act of 1973. The most significant change was the imposition of a $5 million

ceiling on contract cancellation charges. This action effectively prevented the use of multiyear for any more major system contracts. By the mid-1970's, Congress was becoming aware of the folly of the $5 million ceiling since the very programs which could benefit the greatest from multiyear, namely major weapon systems, found it impossible to use the technique. The low cancellation ceiling would leave a contractor with significant start up costs he would be unable to recover. In 1976, the law was amended to allow the Government to enter into multiyear contracts with cancellation charges of over $5 million with prior Congressional approval.

Multiyear contracting was resurrected in the early 1980's by the endorsement of the Defense Science Board as a means of enhancing the industrial base and achieving 10% to 15% savings through efficient weapons procurement [Ref. 12:p. 42]. President Reagan's aggressive expansion of the Armed Services and the initiation of many major weapon systems acquisitions required a means to keep costs under control yet deliver the greatest number of weapons per dollar [Ref. 9:p. 1]. Multiyear played a significant role in the Reagan Administration's acquisition reform efforts, promising average savings of 20% on each program. Its widespread use could achieve savings numbering in the billions of dollars [Ref. 11:p. 15]. Congress passed the Defense Authorization Act of 1982 raising the cancellation ceiling to $100 million while authorizing the inclusion of reoccurring costs on an exception basis, and allowing advance procurement of materials to obtain economic lot prices. This removed most of the major legislative blocks to the use of multiyear contracting for major system acquisitions.

Congress, still concerned about the wisdom of some of its earlier procurement legislation, began to reexamine multiyear. A politically charged atmosphere emerged concerning the billions poured into new major weapon systems. Congress passed Public Law 98-369 in 1983 amending previous guidance on

multiyear contracting. What had only before been DoD guidelines on risk analysis were now made mandatory. The General Accounting Office (GAO) was directed to examine Service proposed programs for not only desirability for use of multiyear contracting but logic of the assumptions upon which recommendations were founded.

Congress has encouraged the use of multiyear whenever possible but added several major qualifications:

1) Contracts limited to economic order quantities of $20 million per year without Congressional authorization
2) Limited to $500 million unless approved by Congress
3) Present value analysis be used to show real cost avoidance between multiyear and annual contracting [Ref. 13:p. 9]
4) Multiyear must show a 12% savings over an annual contract for a new procurement and 10% if a continuing procurement (this requirement was subsequently revoked in October 1990) [Ref. 14:p. 66]

Recent changes were also enacted in the Fiscal Year 1990 DoD Authorization Bill. The Secretary of Defense was required to certify to Congress that the current Future Year's Defense Program (FYDP) fully funded any multiyear contract and that production was not contemplated for anything less than minimum economic rates. From 1986 through 1990, DoD submitted 68 major candidates to Congress for approval to use multiyear contracting. Congress approved only 32 or 47% of programs already reviewed and approved at the Defense Secretary's level. [Ref. 15:p. 4]

Multiyear has faded as a tool of choice for major weapon systems programs. Program managers may have begun to take a hard look at whether the lower cost promise of multiyear is worth the increased scrutiny it brings. Undoubtedly unstable funding as well as the curtailment of new major system

acquisitions programs must also have played a role. Regardless of the cause, the impact has been severe. Not a single new program was funded for multiyear contracting in the DoD Appropriations Bill for 1994.

C. DEFINITIONS

This research has been purposely narrowed to multiyear contracting for major system acquisitions only. It is, therefore, necessary that two terms, major systems and multiyear contracting, be defined so the scope and boundaries of discussion may be properly understood.

1. Major System Acquisitions

The decision to use a multiyear contract in the acquisition of major weapon systems stems from a lengthy and iterative process. This process explores the technical feasibility of applying resources to correcting a material war fighting deficiency in the national strategy. An acquisition strategy is the culmination of this process that seeks to balance and integrate risk and other factors. One element of the strategy is the type of contract and incentives offered to a contractor to achieve the goals of the program. Multiyear is but one element in a larger scheme that influences and is influenced by other elements.

A detailed overview of acquisition policy as well as a definition of major system acquisitions is contained in the Federal Acquisition Regulation (FAR), Subpart 34. The same definition, but in a slightly modified form also appears in DoD's implementing instruction, Defense Acquisition Management Policies and Procedures, DoDI 5000.2. A major system is defined as one in which a "combination of elements...function together to produce the capabilities required to fulfill a mission need" [Ref. 16:p. 3]. Two dollar thresholds pertain to any procurement which will classify a program as a major system:

1) Total research, development, test and evaluation costs exceed $75 million in fiscal 1980 dollars (equal to $115 million in 1990 dollars), or
2) Total procurement exceeds $300 million in fiscal 1980 dollars (equivalent to $540 million in 1990)

Contractual actions for major systems do not represent a large number. For example, in fiscal year 1991 only six programs were submitted to Congress. If all had been approved and awarded in the same fiscal year they would have amounted to less than .003% of all actions placed that year. But the dollar value would have been immense representing nearly 11% of the Title III DoD Procurement budget for that year. Accordingly, these large dollar percentages drive legislation affecting all multiyear procurement.

2. Multiyear Contracting

Multiyear contracting is a special form of contracting where up to five years worth of known requirements may be placed at one time on a single contract. Items acquired may be either material or services and typically run the gamut from strictly commercial to uniquely military products. Multiyear is amenable to both sealed bid and competitive proposals. Resulting contracts may only be of a fixed-price nature or one of its recognized derivatives. Unlike other forms of contracting, funding for an awarded multiyear contract is made available each fiscal year from appropriations passed by Congress. [Ref. 17:p. 17-2] In practical terms, multiyear stops just short of the Anti-Deficiency Act, 31 USC 665, which prohibits the expenditure or obligation of funds not appropriated in advance of contract award.

Procedurally, a contracting activity must issue both a multiyear as well as an annual year solicitation for the first year of a program. An analysis of benefit cost to avoidance cost is performed to determine which proposal is the most

advantageous to the Government. Award may be made on price only or price and other factors. [Ref 17:p. 17-5]

Because of multiyear's longevity and the requirement to fund each year separately, multiyear contracts include the unique provision of a cancellation charge. The cancellation charge becomes operative only if the remaining years of the contract are not funded. It represents reimbursement to the contractor for unrecoverable nonrecurring costs incurred in the first year of the contract which would have been prorated over the life of the contract and included in the per unit price of all items produced. Recurring costs are generally not allowed to be included in the cancellation charge unless approved by the agency head or designee [Ref. 17:p. 17-3]. The contract may still be terminated at any time but total Government liability includes both the cancellation charge for the remaining years as well as current year termination expenses. This may result in a disincentive for the contractor to purchase future material in economical quantities unless he is willing to assume the risk that future years will not be canceled. The magnitude of the cancellation charge may not play a part in the evaluation factors for award.

FAR sets no limit on the amount of the cancellation charge. This was set by separate Congressional legislation in the DoD Authorization Act of 1982. Previously set at $5 million this was changed to a ceiling of $100 million that requires prior approval before being cited. The cancellation charge need not be funded before contract award. [Ref. 17:p. 17-3]

For clarification, the essential characteristics and differences between multiyear and annual year contracting are summarized in Table 2.2.

ANNUAL YEAR AND MULTIYEAR CONTRACT COMPARISON		
Condition	Annual Contract	Multiyear Contract
Usage	General	Very Specific
Length	One Year	Two to Five Years
Liability	Termination Charge	Cancellation Charge
Cost Over Time	Smaller front end Higher overall	Large front end Lower overall

Table 2.2 [Ref. 11:p. III-2]

There are many different forms and variations of multiyear contracting of which some are not available for Government use. The principal variables involved in the different forms of multiyear are whether or not the contract is fully funded, there is an allowance for advance buys, and a variation on the cancellation clause. Possible forms multiyear can take and the characteristics of each are as follows:

1) Fully Funded Multiyear Contract
   - -all funds appropriated at the beginning
   - -no cancellation charge
2) Fully Funded with Advance Buy
   - -labor and material funded in advance
   - -cancellation ceiling included non-recurring costs
3) Incremental Funded Multiyear Contract
   - -funded for one year
   - -advanced material not covered in cancellation ceiling
   - -cancellation ceiling funded for first year
4) Incremental Funded Advance Buy
   - -funding for one year
   - -cancellation funded for first year
   - -advance labor and material purchases covered
5) Multiyear with Funded Cancellation Ceiling

-funding set aside for entire cancellation liability

-no funding for advance buys

6) Multiyear with Unfunded Cancellation Ceiling

-no funding for cancellation liability

-no advance buys

Discussions of multiyear contracting usually involve a standard format that is funded either separately or incrementally by a named Congressional budget appropriation with the inclusion of a cancellation ceiling for at least the first year [Ref. 18:p. 32]. This is the format referred to in this study unless otherwise noted.

D. UNIT PRICING

Unit pricing under a multiyear contract differs from an annual year contract. Due to the longevity of the contract, per unit costs become difficult to calculate as the variables affecting price and cost have greater interaction. Unit pricing is the one element used to form comparisons among different cost proposals. Without an effort to diminish the impact of time on this element, the resulting figures would be meaningless. In order to arrest this erosion, level unit pricing and Economic Price Adjustments (EPAs) are used to affect prices.

1. Level Unit Pricing

Level unit pricing is the preferred method for arriving at a per unit cost since it forces contractors to assume the risk of price fluctuations in the out years of the contract. Conceptually, level unit pricing results in nonrecurring production costs being amortized over the life of a contract resulting in the same unit price appearing for all years of the contract. This has a tendency to either over or under inflate actual costs since contractor costs are based on estimates, usually pessimistic. Additionally, this creates a

disincentive for contractors to invest in productivity improvements. Since nonrecurring investments are spread over the life of the total contract, costs incurred are not fully recoverable until after a calculated payback period usually in the latter years of the contract. Improvements in the form of productivity investments or learning curve effects will occur throughout the life of the contract. The longer the contract runs the more pronounced the effect until a price projected five years into the future may have little relationship to actual costs incurred. Variable pricing may be used but only if the head of the contracting activity feels it is in the Government's best interests to do so. [Ref. 19:p. 19-20]

2. Economic Price Adjustment

An EPA clause is used if a contracting officer determines raw material or similarly economically influenced costs are likely to fluctuate during the period of the contract. For evaluation purposes this achieves the aim of keeping unit prices the same across all years of the contract. With the contractor now insulated from market fluctuations, the risk of price escalation is shifted to the Government. Prices now reflect differences in underlying production efficiencies. Actual unit prices may rise and fall as they respond to market conditions causing problems in assessing total contract price savings after the fact. It may also lessen benefits derived from economic lot size purchases. With little incentive to avoid future price increases, contractors may purchase material and assemblies on a per needed basis instead of large lots.

E. MULTIYEAR OBJECTIVES

The decision to use multiyear contracting presupposes the meaningful benefits bestowed on a program will outweigh any negatives concurrent with using the technique. FAR subpart 17.1 lists eight objectives for the use of multiyear which can

be viewed as potential benefits conferred from one degree or another by multiyear. These objectives are as follows:

1) Lower costs
2) Enhancement of standardization
3) Reduction in administrative burden
4) Substantial continuity of production or performance reducing costs normally incurred by annual contracting
5) Stabilization of contractor workforce
6) Avoid new contractor quality assurance certification
7) Broaden competitive base
8) Provide productivity incentives

The impact of any of these objectives is relative to the program to which multiyear is applied. Indeed, for some programs the objectives may work at cross purposes or be impossible to achieve to any optimal degree. The success of any one element is dependent on the emphasis placed upon it by a program manager's analysis and trade-offs made in his acquisition strategy. Logically, a program selected to use multiyear contracting should exhibit at least one discernable, positive influence. Failure to detect any such influence would lead one to conclude that multiyear was inappropriately chosen for a given program.

F. MULTIYEAR CRITERIA

If the objective of using multiyear is analogous to a program's final destination, the criteria for multiyear is an evaluation of the capacity of the vehicle to carry a program to those objectives. The eventual success of multiyear to convey benefits is entirely dependent on the features of a program that make it amenable to the process. FAR lists five criteria that must be met when evaluating a candidate program for use of multiyear contracting. The language used in FAR is clearly derived from the memorandum issued in May 1981 by then Deputy Secretary of Defense, Frank C. Carlucci entitled

"Policy Memorandum on Multiyear Procurement" [Ref. 19:p. 46]. These criteria were rewritten and restructured and adopted by Congress as part of the Department of Defense Appropriation Act of 1982 (PL 97-86).

The original Carlucci criteria listed six points to be considered, whereas FAR lists only five. While the differences in language between the two might appear to be minimal, a closer inspection reveals a clear divergence. The full text of the two appear in Appendix E.

Both approaches emphasize the need to avoid problems. But the FAR criteria imply a tougher measure of evaluation. The emphasis is upon risk elimination and the promotion of an acquisition strategy rooted in conservatism. Established criteria exist to exclude programs rather than include them in a multiyear approach. Taken to its extreme, only the most mundane, repeatedly bought commercial item would qualify for consideration. While FAR is adverse to risk, the Carlucci criteria seek a reasonable accommodation of risk and benefit. They recognize that problems will arise but seem willing to trust the judgment of senior program officials to make the hard trade-offs to achieve the best result. DoD's version of multiyear contracting is inclusive, not exclusive. Risk is viewed as an important element but one that must be managed not eliminated. The Carlucci version would allow the consideration of many candidates now excluded as marginal by FAR. These differences are further examined below.

1. Reduce Total Costs

The Carlucci multiyear criterion placed its emphasis on substantial cost avoidance or other benefits to the Government. DoD thus envisioned the possibility of benefits such as mobilization or industrial base enhancement being the primary focus of a multiyear contract and not just on cost alone. Benefits were balanced against risk implying that risk was acceptable as long as it was equal to the benefit gained.

"Substantial" was defined in terms of risk where those areas with the greatest risk possessed the greatest potential for cost avoidance [Ref. 20:p. 18]. The FAR language is much more restrictive and timid. A program is to be considered only if "a contract will result in reduced costs." No leeway is granted to acquisition officials for consideration of anything else. If costs cannot be reduced, a program cannot be considered. Nowhere is risk explicitly mentioned as a component of this criterion.

2. Stable Quantities

The second criterion of both the Carlucci memorandum and FAR are that minimum needs throughout a program's life are to remain substantially unchanged. Only those programs whose quantities remain stable over the life of a contract should be considered.

3. Stable Funding

The Carlucci criterion only required the likelihood that funding would reasonably be expected to continue throughout the contract's life. It recognized the probability that program funding might vary and the decision to pursue multiyear was based on a calculated risk. FAR emphasizes quite the opposite. FAR requires a reasonable expectation that funding will remain at a certain level to avoid contract cancellation. It shifts the responsibility to ensure funding continues to the Services, albeit at a reasonable risk. The Services once having decided on multiyear must continue to seek it to avoid cancellation. One of the goals of multiyear thus becomes the avoidance of cancellation. Whether intended or not this imparts a measure of protection to a multiyear program. Once a program makes it to the exclusive multiyear designation, the Services are incentivized to continue asking for funding. If not and Congress judges Service commitment to

its multiyear candidates as waning, Congress may cancel the remaining out years without hesitation.

4. Stable Design

The language of both mandates a program complete all phases of research, development and testing as well as evaluation before consideration. But the Carlucci language did not view the design aspects of programs as immutable. The risk of design change was acceptable as long as the benefit gained exceeded cost. FAR on the other hand mandates a stable design with the risk design change being practically negligible before consideration.

5. Realistic Cost Estimate

Lack of confidence in cost avoidance figures was and continues to be a major reason for the disapproval of programs for multiyear. The Carlucci criterion stated that only a reasonable assurance must exist that the final cost and cost avoidance figures are as accurate as possible. Since data are provided by the contractor, the use of either proven cost estimating formulas or past costs represent an acceptable risk of accuracy. The FAR language recognizes no measure of error or judgment and flatly requires both must be realistic.

6. Confidence in the Contractor

DoD and FAR diverge on this criterion since it is not listed in the FAR. DoD's consideration of this criterion is inseparable from the fifth criterion. Since contractor data are relied upon for decision making, confidence in the contractor's data is paramount. Moreover, confidence in a source implies something greater than a responsibility determination alone. However, a positive affirmation in the confidence of any potential source selected to perform a contract seems to imply something greater than responsibility alone. A contractor judged responsible might not possess the

full confidence of a contracting officer. Used as an evaluation factor, this additional criterion might have excluded many capable contractors allowing award to preferred sources. It may be for this reason that it was eliminated. It may not have made it into FAR since it could be construed as an additional determination of responsibility.

G. OTHER CRITERIA

Apart from those criteria listed above or in FAR, there are two other unofficial considerations that must be examined before proposing a program for multiyear. These are political considerations, and the extent of competition for defense dollars with other programs. [Ref. 20:p. 9]

1. Political Considerations

The players in the acquisition of a major system are driven by their own goals and perceived rationalities. These rationalities can be termed either "acquisition culture" or political consideration and cannot be divorced from both general and practical decisions. GAO found that major system acquisitions are susceptible to a variety of external influences and pressures. These pressures influence acquisition strategies by hampering both program manager and contracting officer decisions. Two primary results are the destabilization of funding or design impairment resulting in either large cost increases or schedule slippage. [Ref. 21:p. 2-4]

The B1B program provides an illustrative example of these influences at work. Canceled by President Carter in 1977, President Reagan resurrected the B1B program in 1981. The high cost of the program ($10.7 billion) necessitated the application of measures that promised to cut or control costs. Multiyear was viewed as one such measure. The program was pushed as a multiyear candidate in fiscal year 1984 despite design problems and insufficient cost data [Ref. 20:p. 31].

Once accepted as a multiyear candidate the Air Force continued to push for multiyear funding to support the B1B each year. Technical problems were optimistically predicted to be correctable within the life of the production contract. Unfortunately, technical problems linked to unstable and unproven design changes never were corrected to a sufficient degree to allow the aircraft to perform within its anticipated performance parameters. Retro fixes cost an estimated $1.9 billion which more than exceeded the $1.268 billion expected in savings from using multiyear contracting. [Ref. 13:p. 23 & 55]

Political considerations in this example provided a measure of protection but the opposite may just as well be true. A multiyear contracting political consideration analogy may be derived from the example of an aircraft approaching and exceeding the sound barrier. Turbulence approaching the barrier may destroy even a structurally sound aircraft if approached from the wrong angle, but once beyond it, control returns and a measure of security is achieved. Similarly, a major system multiyear candidate approaching legislative review may safely transverse the "barrier" or be imperiled by the animosity it faces despite its merits. Once past the approval stage, the interests propelling a program forward are guaranteed a measure of security from cancellation. The security of a program, like that of an aircraft to withstand turbulence, becomes a measure of both its internal strength found in logically interconnected arguments and its angle of approach. Weak programs if fortified sufficiently with enough political backing may still achieve the proper "angle" and still secure a measure approval. The task becomes to judge not only the internal strength of a program but the resistance of forces allied for and against it.

2. Program Competition

Due to the expectedly prohibitive cost of cancellation for a major system acquisition, funds for an approved multiyear contract are usually irrevocably committed. In times of budget instability, a multiyear contract reduces total available funding for DoD and reduces Congressional flexibility to reallocate the budget. In the hunt for scarce dollars, multiyear programs may take funding away from more promising systems. Moreover, because of its stable design criteria, yesterday's technology is funded and continued at the expense of state of the art design. If a program has already been approved for multiyear this may ensure program survival. If only just proposed for use with a new program, a multiyear acquisition strategy might elicit increased review and second guessing. [Ref. 20:p. 9]

These features have not gone unnoticed by DoD. Shown in Table 2.3 are data for major system acquisitions submitted to Congress for approval to use multiyear contracting from 1985 to 1991 as listed in Appendix A.

PROPOSED MULTIYEAR CANDIDATES AS A % OF DOD PROCUREMENT			
Fiscal Year	Total Authority	Cost of MYC Submitted	As Percent of Total
1985	$97.111 M	$10.532 M	10.85%
1986	$92.608 M	$10.832 M	11.70%
1987	$85.270 M	$20.452 M	23.98%
1988	$84.195 M	$ 9.281 M	11.02%
1989	$79.323 M	$ 9.127 M	11.51%
1990	$83.440 M	$18.663 M	22.37%
1991	$67.177 M	$ 7.096 M	10.56%

Table 2.3

The projected cost of these systems and the approved Title III Procurement Appropriations budget for that fiscal year are compared and a percentage of multiyear to total

procurement dollars derived. An interesting pattern is revealed in this comparison. Except for fiscal years 1987 and 1990, DoD has consistently asked for approximately 11% of its total procurement budget to be set aside for new multiyear procurement. The consistency of this pattern is either a unique coincidence or an attempt to manage total dollar outlays for multiyear to a fixed percentage of the total DoD budget. This adds insight to a comment made by Secretary Carlucci, before the House Committee on Defense Appropriations in April 1989, that the Services have always resisted the full implementation of multiyear because the Service Chiefs felt it would reduce their budget flexibility.

H. ADVANTAGES AND DISADVANTAGES

Quite naturally many of the advantages and disadvantages of multiyear contracting stem directly from its length. Multiyear does away with the inherent economic inefficiency of annual year contracting's "start-stop" routine for large or complex purchases that stretch over several years caused by different annual appropriations. Contractors reluctant to make larger purchases of raw materials and semi-finished goods without some measure of risk reduction, are covered by its cancellation ceiling clause.

Four distinct features are often mentioned by proponents and opponents to multiyear which can be further subdivided into more specific areas [Ref. 22:p. 4]. These are:

1) Economic/cost savings
   - -reduced administrative cost
   - -inflation avoidance
   - -capital investment
   - -Economic Order Quantity (EOQ) procurement
2) Business efficiencies
   - -improved production efficiencies
   - -competition
3) Mobilization

-industrial base enhancement
-improved mobilization preparedness

4) Budget considerations
-decreased budget flexibility
-cancellation liability

1. Economic/Cost Savings

Administrative savings is one of the items often cited as occurring with multiyear contracting. This occurs when costs for contract preparation and administration are avoided due to fewer contracts being prepared and negotiated. Undoubtedly costs are saved when fewer proposals are processed but the magnitude of these savings is open to question. Few, if any, contractors hire personnel to prepare and negotiate a single contract. The same is true of Government procurement offices. Instead, the normal process is for procurement personnel to be retained to negotiate and manage problems which may arise following a contract award as well as be available to handle surge requirements. During the researcher's personal experience at two major contracting activities, no procurement personnel were released when workload decreased.

Direct costs saved from contract preparation and negotiation by switching to a multiyear contract may only be absorbed into indirect overhead pools applied to all contracts. The Government would in effect be subsidizing the use of multiyear contracts by allowing contractors to shift the cost of their procurement operations on to other commercial and Government contracts. Savings on one multiyear contract cannot be isolated from the cost of total procurement for the firm. The research literature tends to indicate more effort is put into a single multiyear contract than an annual year contract but less than multiple single years [Ref. 11:p. A-10]. It is not clear if costs are treated as additive over five years or unique to each proposal. Little, if any, information exists as to whether the effort to

monitor a multiyear is more extensive or not. The magnitude of savings, if any, is at best small and probably negligible. [Ref. 23:p. 24]

Savings from inflation avoidance is another area often cited as being one of the benefits of multiyear. Savings accrue by purchasing or manufacturing an item at today's interest rate instead of doing so in the future and incurring higher costs brought about by inflation. There are problems with this scenario. Going from an annual year contracting project to a multiyear may reduce the current year costs of a program but it simultaneously increases the total cost to the Government. Spending current dollars for projects not needed until the future results in an opportunity cost as well as deficit spending. This reduces the availability of funds for more urgently needed projects as well as increasing the need to borrow money. Typically interest rates will exceed inflation rates for all but the most unusual economic conditions. The Government will pay more in compound interest than the cost of the item when needed [Ref. 23:p. 23]. For example, if inflation is 5%, spending $100 now instead of $105 later does not result in a savings of $5 but a loss of 25 cents (105 x .95 discount factor = 99.75). Even with inflation at 5%, spending $100 to avoid paying $120 later does not result in a true savings of $14 (120 x .95 = 114) because the opportunity to spend the $14 on something more urgently needed is lost. Even if true savings did accrue from inflation avoidance (such as when inflation out paces interest rates) FAR requires the inclusion of an EPA clause in all multiyear contracts. An EPA clause constrains the Government from realizing any gains due to inflation, while opportunity costs and discounting inflate the real cost of doing business. Congress is aware of this problem and requires that any program submitted for multiyear must provide present value calculations showing where savings come from. Congress has disapproved programs which showed principal savings benefits

being derived from inflation avoidance only [Ref. 13:p. 45]. The hurdle of a 10% rate of savings was in all likelihood enacted for this reason.

Multiyear savings from capital investment occurs when the cost of investment is recouped at a greater amount than the initial investment. The extent of investment savings varies widely. Most, if not all, multiyear contracts are follow-on contracts to annual contracts after design stability has occurred. The majority of investments should have already occurred before a multiyear becomes effective. Additional capital investments may result in diminishing returns with less being recouped per dollar to obtain smaller production efficiency plateaus. The research literature reports most contractors making greater capital investments than would have been expected resulting from a multiyear contract. One study found Sikorsky making an additional $18 million investment for its Black Hawk helicopter. Grumman, on the other hand, invested only a marginal amount for its F-16 fighter aircraft since it could rely on the Air Force's technology modernization program for significant upgrades [Ref. 24:p. 7]. GAO found that 81% of contractors surveyed reported a multiyear contract influenced their decisions to make a capital investment [Ref. 25:p. 2]. Program managers and acquisition officials must be cautious in assuming plant investments will automatically occur with a multiyear award. Savings are entirely dependent on the number of previous annual year contracts, the type of contract and the number of items produced. Nonetheless, since investment in the industrial base has been an objective of DoD profit policy since the revision of the weighted guidelines, multiyear contracting stands a better chance at achieving it than a similar number of annual year contracts.

Economies of scale procurement provides perhaps the greatest and best documented savings from multiyear contracting. Savings are achieved by purchasing raw materials

and subassemblies on a greater than immediate need. Since large quantities are bought, the cost per individual item is less. Numerous studies have documented real cost reductions stemming from the application of this most basic of all economic theories. The GAO found that 47.9% of savings on one major weapon system was due to economies in vendor procurement while another study found 75% of the cost savings to the same factor [Ref. 26:p. 2 & Ref. 11:p. a-6]. Balancing this are several factors to be considered. The first is materials bought early in the production cycle may increase warehousing costs. Funds will also be expended at a greater rate than if materials were procured on an "as needed" basis. This tends to work against any attempt to control costs by using just-in-time warehousing or purchasing. Second, even though the design for a multiyear item is required to be stable, material bought too early in the process may have to be scrapped due to engineering changes introduced to later save costs.

2. Business Efficiencies

Production efficiency is influenced in part by investments made to achieve labor and fabrication savings. Other benefits are derived from enhanced control. Multiple years allow better scheduling and use of production capacity. There is no need to produce items in a rigid sequence if this is not the best method to save costs or take advantage of other efficiencies. Flexibility is furthered by creating the opportunity to train employees to a higher degree. A more highly skilled work force can be retained for a longer period of time resulting in greater application of learning curve effects. Instability of the work force has been noted as an attribute of annual year contracting and one of the leading causes of efficiency loss [Ref. 27:p. 4]. The GAO found increased worker familiarity with productive tasks and greater efficiency in its analysis of the Army's Multiple Launch Rocket System (MLRS) multiyear contract [Ref. 28:p. 9]. The

magnitude of these efficiencies has not been measured with any great level of certainty. Therefore, it must not be assumed that a multiyear contract will invariably result in greater production gains. How the terms of delivery are worded could negate labor efficiency. Mandated deliveries providing an exact number of finished items to be delivered per year on a multiyear contract could be just as disruptive as an annual year contract. This would force a company in essence to produce on an annual year basis and lose many of multiyear's benefits. Less than optimal delivery schedules must be balanced with the needs of the program and still retain as many efficiencies as possible.

Competition under multiyear contracting will supposedly induce more producers to enter the marketplace. While this may be shown theoretically via mathematical application of economic principles, actual data are rather inconclusive. One study of subcontractors found multiyear contracting stimulated competition and increased subcontractor participation [Ref. 11:p. a-10]. This is in contrast with another study that found no increase in unsolicited bids or new suppliers for subcontractors [Ref. 29:p. 82-83]. The latter would probably be correct if peak efficiency had already been achieved by subcontractors in the market. Additional subcontractor entrants after this point would consist of only marginal producers. Data to support this explanation are not available.

Multiyear contracting may also provide prime as well as subcontractors a technological and production advantage over potential competitors. Contractors locked out of a contract may find little incentive or opportunity to remain technologically current. This lack of opportunity reduces competency which in turn exacerbates any future opportunities to compete. Original guidance in the Armed Services Procurement Regulations (ASPR) cautioned contracting officers about creating just such a situation [Ref. 27:p. 27-28].

Paradoxically, multiyear may theoretically erode the competitive process that acquisition officials seek to preserve and foster. Acquisition officials must be constantly aware of Government data and information rights to prevent the unknowing creation of a sole source situation for future contracts.

3. Mobilization

Much has been made of multiyear's ability to enhance the defense industrial base and influence wartime mobilization. The Defense Science Board in recommending multiyear contracting in 1980 did so because of its efficacious impact on the defense industrial base [Ref. 30:p. 15]. GAO found in examining the F-16 program that both the prime and subcontractors believed multiyear had increased their surge capacity and strengthened the defense industrial base [Ref. 31:p. 15]. This finding is consistent with contractor and subcontractor feelings expressed in other surveys [Ref. 32:p. 37]. While the immediate impact on the defense industrial base's ability to manufacture an item is readily apparent, the contribution of multiyear to the long-term preservation of that ability is not conclusive. One of the first multiyear contracts placed in the early 1960's was for the Army's five-ton truck now being replaced by the Family of Medium Tactical Vehicles (FMTV). The capacity to produce the five-ton truck is no longer available. The same parallel can be seen with the decline of the commercial shipbuilding industry of this country. The principal question is how long can a capability exist when a production line becomes "cold"? Multiyear may not produce any greater benefit than a series of annual year contracts could. Its main impact may be the reassurance planners are given knowing that a production line will remain open for a number of years. Even this may be illusionary. Recently the Pentagon has come under harsh criticism from GAO for having more procurement dollars projected in its FYDP than

could reasonably be available [Ref. 33:p. 2-3]. If the basic document for projecting the defense needs of the United States is open to question, multiyear's seeming productive certainty may exist only as window dressing to assure program stability that cannot in fact exist.

4. Budget Considerations

The cancellation ceiling liability of multiyear contracts is its most distinguishing characteristic. A look over 20 years worth of data on multiyear contracting starting in the 1960's show the dollar value placed at risk to the Government for cancellation is small. During this time, 14% (6 of 42) of multiyear contracts were canceled. The percentage cancellation fees ranged from 1% to 6%, for an average of 2.6%. During the same time for which data are available, multiyear contract cancellation contingencies ranged from 26.5% to 1% for an average of 8.1% of program costs. Over 95% of the time the cancellation charge fell within 0% to 7.2%. [Ref. 11:p. III-10 to III-20] These figures indicate contracting officers are needlessly overstating cancellation percentages and the concurrent funding mandated to provide full cancellation liability coverage.

The reason for including a cancellation liability is to reduce contractor risk and encourage expenditure of nonrecurring costs in capital equipment. It becomes a motivator for contractors to do those things which will ultimately provide a lower unit price to the Government. It follows that the higher the cancellation ceiling the greater the potential productivity that can be achieved on a contract [Ref. 34:p. 22-25]. The disadvantage of the cancellation liability is that it commits funds for a contingency that may never occur. This leads to Congressional concerns over decreased budget flexibility. Congress has often been chastised as an opponent of multiyear contracting for failure to yield on this point. Notwithstanding the merit of the

charges, Congress has been willing to allow some encroachment on its budget flexibility. Currently some 50% of the Federal budget consists of unrestrained and uncapped entitlement programs. A solution has already been suggested to this problem. It requires a careful study of the conditions that would evoke the cancellation contingency and the use of a quasi insurance program to fund the ceilings for all multiyear contracts [Ref. 35:p. 43-44]. The real problem may be not with Congress per se but with the failure of DoD acquisition officials to convince Congress why it is in the public's best interest to forego some measure of budget flexibility for savings.

I. INDUSTRY PERSPECTIVE

So far the primary focus of this inquiry has been Government benefits. The industry perspective has not often been expressed to all its ramifications. But what has been expressed shows near total agreement and enthusiasm for multiyear. The Defense Science Board of 1980 was perhaps the foremost forceful contractor voice for multiyear that had a great influence on Government policy. These sentiments to a very large degree helped resurrect the concept in the early 1980's.

Chaired by a corporate chief executive officer, the Board is composed of 15 members of whom nine are from industry. It advised that if stability could be achieved in defense programs the consequent positive effects would yield an improvement in the defense industrial base. The best way to achieve this stability was by using multiyear contracts. With an assurance of a solid program, contractors would have more incentive to invest in productivity measures. [Ref. 30:p. 68-69] These measures would in turn create a synergetic "trickle down" effect helping subcontractors as well as other non-defense businesses to strengthen the total industrial base.

The Defense Science Board conducted several surveys of major industry groups. Forging industry contractors, a business with steadily declining membership, expressed an interest in seeing the Government shift to a greater emphasis on long-term or multiyear procurement. A survey of subcontractors found essentially the same thing. A majority thought multiyear contracts would reduce costs and provide the necessary stability for them to make productivity improvements in their operations. Likewise, a majority of electronic vendors thought multiyear would aid productivity improvements. It was viewed as one of the top three measures needed to reduce manufacturing lead time. Many felt it would also help in obtaining bank loans and financing [Ref. 30:p. 155 & 174].

The significance of the 1980 Defense Science Board lay not only in what was said but who said it. The Board was a united industry voice trying to come to grips with how to solve many nagging industrial base problems. Over time, the voice of industry has continued to maintain the same enthusiasm for long-term contractual relationships despite often lukewarm Government interest. [Ref. 7:p. 71]

J. MANAGEMENT AND MULTIYEAR

Industry's continued enthusiasm for long-term contracting resides in a complex interaction of management goals and sociology. Commercial firms are organizational entities that exist in a complex cultural and sociological milieu that cannot be divorced from other concerns. They are by their nature social units brought into existence to pursue specific social goals which become in turn buffeted and molded by the environment in which they are created. Goals, often defined as the state or existence toward which an organization is moving, are reflected daily in the actions, statements and aspirations of not only those at the top but all members of the organization as well [Ref. 36:p. 5-7]. How an organization acts is as much a reflection of its stated goals

as well as sociological undercurrents. Multiyear contracting simultaneously fulfills many of these goals and urges.

One simple goal often espoused by business organizations is that of profit maximization. This implies a subordination of all other activities and pursuits to its achievement. A cursory reflection on this proposition reveals its inappropriateness to account for business activities. The diversity of goals striven for in each business decision is best reflected in the management philosophy of Peter Drucker, one of the best known purveyors of management theory. Drucker states that businesses are motivated to achieve a number of simultaneous objectives to please the desires of many different groups. Businesses set objectives and goals in eight areas. Of these eight areas, the pursuit of profit, comprises just one decision area and may not necessarily be the most important. The other seven are market standing, innovation, productivity, physical and financial resources, work performance, employee development, and public responsibility [Ref. 37:p. 16]. The integration of multiyear with Drucker's eight goals is contrasted in Table 2.4.

COMPARISON OF DRUCKER'S EIGHT BUSINESS GOALS TO MULTIYEAR AND ANNUAL YEAR CONTRACTING		
Condition	Multiyear Contract	Annual Contract
Profitability	Long-Term Growth	Short-Term Gain
Market Standing	Long-Term Strategy	Maintenance
Innovation	Based on Time	Based on Contract
Productivity	Learning Curve	Current Ability
Resources	Capital Investment	Current Resources
Performance	Quality Image	Short-Term work
Employee Development	Long-Term training	Short-Term; emphasis on task
Responsibility	"Good Neighbor"	"Business First"

Table 2.4

Are there real differences that would motivate a business concern to prefer a multiyear contract over an annual contract in light of these goals? Yes. In all these instances a multiyear contract contributes to a superior result solely because of its greater time horizon. This allows the maturation of strategies that work to balance conflicting goals. With a longer time horizon, long-term strategies and the nuances often associated with them have time to unfold. Sequential emphasis can be placed on goals instead of prioritizing which deems some absolutely more important than others. An infatuation with current year financial returns is instead replaced by sound management allowing experienced managers, not financiers, to effectively direct the company.

Multiyear may enhance profitability by allowing a firm to bring to the table all the other attributes of good management. Because time is exempted as an immediate concern, decision making can focus on those elements which sustain and enhance long-term profitability instead of worrying about this year's bottom line. One study showed managers of large corporations often mention concern for products and public service over that of profits. This is in contrast to small business managers who more often cite profits as a major concern [Ref. 38:p. 365-394]. The reason for this may reside in different perspectives on time. Small firms must focus on the short run or become one of the alarming small business failure statistics. Large firms focus on longer time frames due to their proven longevity track record. Longer time horizons, whether the result of past history or other circumstances, reward and reinforce profitability in a symbiotic relationship. A corollary to this may be if Government seeks to enhance small business survival, it should grant more multiyear contracts to them.

Multiyear relationships may also affect market standing. In Government procurement, market standing is assured by a multiyear contract since a firm stands to own a market for a

number of years. Dominance in turn may create an opportunity for innovation if management is wise enough to seize the opportunity. A shorter time period may engender conservatism whereas a longer view allows an opportunity to experiment and perhaps achieve a breakthrough. Productivity is enhanced as each additional lot benefits from the learning curve effect. Similarly, capital investments made under a multiyear arrangement are more secure than that under an annual contract. The longevity of the contract allows some measure of return to be realized from capital productivity enhancements. As a last resort, the cancellation contingency in a Government multiyear contract provides assurance to some extent. If the contract does not run its full term, capital investments will not be lost. It goes without saying that multiyear's affect on the actual and presumed image of a product's quality is striking. The Deming quality philosophy describes an emphasis on the short-term as one of the "Seven Deadly Diseases" and notes its contribution to undermining quality and productivity [Ref. 4:p. 36]. Extended multiyear production runs also aid in the quality and image of the company. Defects from a multiyear contract can be discovered and corrected at levels inconceivable with an annual year contract. This helps to protect and enhance a firm's quality image by sending a message to customers that the company is concerned with the useful life of its products.

There are powerful intangible incentives for an organization to favor a multiyear contract even it if were not as profitable as an annual year contract because of its ability to accomplish multiple goals. An organization need no longer choose between employee training and profits. The latter is assured by effectiveness which may be gained from the former. Equally important, such firms may be viewed as an asset to a community by promoting stability in subcontractor business relationships and employee spending in the local economy. Annual year contracts may lead to hiring stops and

starts casting an image of the company that views employees as disposable. An enhanced image from longer term contracts rebounds to the company in the form of greater "good will" which may spur investment interest.

K. SOCIOLOGY AND MULTIYEAR

Another explanation of why businesses prefer long-term relationships may be found in an extrapolation of sociologist Max Weber's pioneering work on authority and bureaucracy. Weber noted that bureaucratic organizations are the most suitable social units for the achievement of organized, rational objectives. They have a very specific and recognizable structure that aids in the fulfillment of goals. Authority in a bureaucratic organization is invested in positions and not that of any one particular person [Ref. 39:p. 148]. Loyalty is focused on the position and to the organization within which it exists. Position loyalty is transfused to organization loyalty. The original organization goals become intermixed and identified with the organization that espouses them. By inference, to achieve these goals, the organization must first assure its own continued existence. The primary goal of a bureaucratic organization becomes its continued existence and the elimination of threats to its longevity. [Ref. 36:p. 50-57] Persons working in a bureaucracy are by extension working foremost for its continued existence.

Unlike Government, corporate America must fund its continued existence through the marketplace via contracts for goods and services. The completion of any one contract may represent the last contract received by the organization. This evokes a crisis of continuity in the bureaucratic organization which is not averted until the next contract is received. Continuity is assured by its cash flow for only a limited period of time. Annual year contracts, by the nature of their short time horizon, contribute to this state.

Multiyear contracts, on the other hand, largely avoid the continuity crisis by postponing it until sometime in the distant future. Operations are continued on a daily basis as if the contract will never end. An organization possessing a multiyear contract reduces the near term possibility of its "death" and may continue to strive for other goals such as market share. Organizations are therefore systemically inclined to seek out long-term contractual relationships because of the need to assure continuity of the organization.

L. CONTRACTOR CONCERNS

A survey of the electronics industry conducted for the Defense Science Board in 1980 identified three factors common to all contractors that if acted upon would advance Government and industry relations. These were: 1) an adequate return on investment for contractors, 2) a stable market place and rate of production, and 3) a reduction in Government red tape [Ref. 30:p. 186]. Industry leaders participating in this study were concerned that a commercial viewpoint was absent from Government decisions. Two years later, a similar feeling was expressed in a survey for the growing impetus to use multiyear contracting. Six items were identified by one contractor as major areas of concern not adequately addressed by the Government [Ref. 18:p. 155]. While not the only concern contractor's might have, they provide a departure point from which the process can be examined.

1. Contract Risk

The objective in choosing a particular contract type is to achieve a reasonable balance of risk assumed by the parties with an incentive for economical and efficient production [Ref. 17:p. 16-1]. Contracts are risk allocation devices spanning the spectrum from firm-fixed-priced (the greatest contractor risk) to cost-plus-fixed-fee contracts (the least risky to the contractor). Taken as a whole, a contract and

its clauses are a picture of the risk allocation decisions made by the parties to that contract. Furthermore, the greater the risk the greater the opportunity should be for compensation. For those contractors accepting a risky contract type capable of controlling costs better than anticipated, the benefits translate into greater profits.

Multiyear contracts are limited by regulation to one of the fixed-price instruments [Ref. 17:p. 17-2]. Out of 17 proposals submitted to Congress for consideration of multiyear contracting in fiscal years 1990 and 1991, eight were proposed to be firm-fixed-price, eight were firm-fixed-price with an EPA, while only one was proposed as a fixed-price-incentive-firm contract [Ref. 40 & 15]. The Government preference for the more risky instrument is understandable since risk is shifted to the contractor; contractor acceptance and even acquiescence of risky contract types is not. This leads to one of two diametrically opposed conclusions. The first is that the risk element is greatly overstated. A dispassionate analysis of inherent risk would lead a contractor to conclude multiyear contracts were too risky if the real risk were as great as theorized and used in conjunction with a firm-fixed-price contract. The second point is that contractors accept multiyear contracts, high risk and all, because the risk is worth the potential payoff benefits.

Industry has repeatedly warned of the high risk element inherent in multiyear contracts [Ref. 30:p. 155]. Are some contractors less risk adverse while others are just foolhardy for accepting a multiyear contract? No, because business by its nature is risky. What this contradiction may be telling Government contracting officers is that the type of contract used for multiyear is not appropriate. With increased time, the risk of a multiyear may grow too great for all but the most financially secure companies. Cancellation charges, EPAs and the like are but only a few methods of defraying risk. Shifting to a less risky contract type within the legal limits

of doing so may provide a better fit between risk and reward. A Fixed-Price-Incentive-Firm (FPIF) contract might be a more rational and logical choice to distribute risk from a contractor's perspective. This contract type ensures delivery of a product for the Government yet also reduces the risk to a contractor if constructed properly.

2. Amortization of Investment Costs

Key to any projected multiyear savings are the investment decisions made by contractors in productivity saving equipment. If costs cannot be spread out over an adequate number of units, profits may be imperiled and company finances threatened.

An example of this occurred on FMC's multiyear contract to produce the M-2 Bradley Fighting Vehicle. Originally planned for 3000 units, this was downsized to 1200 forcing amortization of costs to be spread over a smaller number of units. Per unit prices were increased over $170,100 [Ref. 14:p. 56]. Subsequent negotiations over the issue forced the Government to accept a $50 million liability for closure of a production plant [Ref. 14:p. 64].

The GAO has many times noted the positive impact multiyear has had on contractor investments [Ref. 25:p. 2]. Critical to these investment decisions was contractor achievement of an acceptable rate of return, perception of future sales, and the cost of investment financing. Ideally, what contractors most desire is for multiyear to live up to its selection criteria of program stability. They would desire no downward change in the contract quantities that would disrupt investment decisions. That Government multiyear candidates have always done this indicates a possible systemic problem in selecting programs. This may in part be the reason behind why of eleven multiyear contracts examined by GAO, three showed an average cost increase of 7.33% while the remainder showed only an average cost decrease of 13.44% from

the previous year's annual contract [Ref. 26:p. 2-3]. Clearly some unanticipated or unintended combination of variables must be robbing programs of savings from investment decisions. The challenge is to allocate the impact of these variables and emphasize only those which have a significant impact on a program.

3. Program Selection

The decision as to which programs are selected to use multiyear contracting resides with the Government, and in particular a program manager and his selection of an acquisition strategy. This has not prevented contractors from suggesting programs they believed were viable candidates. Some have even gone out of their way to impress upon the Services the benefits of selecting a particular program. An example was the effort launched by Hughes on behalf of its Phoenix missile in 1974. Hughes had to convince a reluctant Navy to try a multiyear even to the degree of exposing itself to greater risk than may have been warranted [Ref. 18:p. 37]. Overall, industry influence on the selection process has been minimal.

Typically most major acquisition programs take from 7 to 12 years before being fielded [Ref. 41:p. 15]. Since instability in design and funding are prime characteristics of these programs, a decision on multiyear is usually made late in a program's life despite the need for a comprehensive acquisition strategy from the beginning of a major system acquisition. Once production has begun and forecasts are firm for the next two years, consideration for using multiyear is made at the Milestone III decision for full scale production [Ref. 42:p. 5-41]. This late decision may forfeit many potential benefits. It also tends to bring the contractor into the decision process at the last stage making his input look self-serving at best.

A measure of industry's frustration at having little input into this decision is reflected in extemporaneous comments. Industry has warned that good programs can be made better with multiyear, but if misapplied, good programs can be made worse [Ref. 18:p. 39]. Industry would like more involvement in the selection process. Earlier involvement allows a reduction or moderation in risk as well as providing a check on the feasibility of extracting savings by going multiyear. Program managers might be wise to consider this at stages earlier than current guidance suggests. Contractor production knowledge, market information, and business instincts may provide the expert market research necessary for program managers to make good multiyear decisions.

4. Cancellation Liability

The primary goal of including a cancellation clause in a multiyear contract is to provide a measure of risk protection to contractors to encourage capital investment in productivity enhancing devices. Cancellation liability was mandated to be funded completely from 1973 to 1981. This was relaxed to allow a maximum of $20 million in unfunded liabilities without first notifying certain Congressional committees. But the level of cancellation ceiling liability and the method by which it is calculated is dependent on the players involved in the process. The Congress, the Services and contractors all have different objectives in arriving at an acceptable cancellation level. Congress seeks to maintain its budget flexibility while at the same time furthering a political agenda. In the early 1980's, full funding was a means of putting a brake on massive DoD spending [Ref. 43:p. 10]. With notable exceptions, Congress gravitates toward full funding. The Services seek to obtain savings from multiyear and apply them to other programs to prevent less high profile programs from being financially crowded out. The Services also tend to move toward a low percentage of cancellation liability.

Contractors, to prevent financial loss, desire the greatest degree of investment protection. They tend to feel strongly that the cancellation liability should be funded completely [Ref. 22:p. ii].

This difference between contractor and DoD approaches tends to create conflict. A high cancellation ceiling shifts risk back to the Government, whereas a low ceiling places some of it on the contractor. FAR gives the contracting officer the flexibility to determine the cancellation ceiling. While this is beneficial to the Government, this very flexibility is the source of contractor anxieties. Contractors may feel that a consistent Government approach is preferable to a flexible one since the latter injects too many unknowns.

5. Acquisition Regulations

Contractors have clearly expressed an opinion that the Government contracting process is its own worse enemy. One study found that the most frequently cited reason for not having participated in defense contracts was that paperwork connected to the contracting process was too burdensome [Ref. 3:p. 48]. Another study found that 94% of contractors agreed that Government contracting methods were more difficult to understand than commercial methods, while 82% thought that if DoD used commercial contracting practices the end result would be a lower priced product [Ref. 44:p. 124-125].

The focus of these surveys was not on multiyear contracting. However, multiyear with its more elaborate approval process, specialized clauses and written cautions to Government contracting officers would probably be perceived in the same way. Contracting regulations governing the use of multiyear contracting have gotten more detailed since the early 1960's. Ironically this detail has blossomed in the face of efforts to reform and streamline the acquisition process. Multiyear does require more preparation and insight than a normal contracting process. But its use can be likened

to that of a scalpel; it can either do great harm or great good depending upon the skill of the practitioner wielding it.

There has been little incentive for Government officials to make rules for using multiyear any more accessible. Obtuse rules dissuade all but the most knowledgeable from attempting the process. Authority and jobs may therefore remain concentrated in a few major commands possessing the resources and expertise. Industry desires to see multiyear more accessible and easier to understand will only occur when those exercising power over the regulations are incentivized to simplify them.

6. Profit

Profit has been defined as the earned surplus of an enterprise after all legitimate operating costs have been meet. More pointedly it has also been termed the reward for assuming risk [Ref. 45:p. 58]. Official DoD profit policy has been to attempt to reward risk and encourage contractors to make investments in equipment and facilities. But unofficially, the policy at times seems to be to keep profit as low as possible and still complete the task at hand. DoD's "Defense Financial and Investment Review" conducted in 1985 noted that defense contractors were 35% more profitable than similar commercial manufacturing during the period 1970-1979. For the first four years of the 1980's, this increased to where defense firms were 120% more profitable than non-defense firms. [Ref. 46:p. E-1]

Such statistics have cast doubt on contractor profit concerns. This is unfortunate since profit erosion from Government action is a legitimate concern [Ref. 2:p. 155]. Without an adequate and assured return on investment, the incentive for defense contractors to invest in productivity devices does not exist. Contractors are especially concerned about multiyear since large costs and greater time periods have a tendency to magnify risk [Ref. 47:p. 5]. EPAs may

lessen the impact of inflation, but no mechanism exists to lessen Government and market problems that diminish profits. While in special cases an adequate return might be ignored (e.g., market penetration), a decision to forego it over several years of a multiyear contract could either lead to economic catastrophe or a decision to concentrate on more lucrative commercial work. Either way, a potential supplier may be lost to the defense industrial base.

One suggested solution to reduce profit risk is a mechanism termed prospective economic adjustment. This method would readjust profit rates at future periods paralleling anticipated award rates for future annual year contracts. Using forecasted economic data, it would be possible for contractors to renegotiate profit returns each year. In this way some of the dynamics of an open market are artificially injected into a multiyear contract [Ref. 47:p. 11-14]. The difficulty with this procedure comes in its proper application.

An examination of contractor profit concerns for multiyear stumbles on the fact that an adequate study of contractor profits under multiyear contracting has never been conducted. The exact relationship of risk to profit on multiyear contracts is unknown. The weighted guidelines method of profit determination, used for all major negotiated single source contracts, offers little advice on how to determine an adequate multiyear profit. In the absence of guidance, contracting officers are likely to apply old formulas stretched to fit multiyear's greater period of time. This may or may not be adequate for the risks involved. Without such information, it is impossible to address the problem properly and do anything to rectify it.

M. CHAPTER SUMMARY

The past 30 years have seen the concept of multiyear contracting develop through several distinct phases. Created

to resolve vexing funding and procurement problems, the concept has expanded from simple repetitive procurement use to major system acquisitions. This expansion has both hurt and helped the awareness of multiyear contracting. Most of the recent legislation has been a reaction to problems encountered with multiyear as it was adapted to these major programs. Touted in the 1980's as one of the key reforms to improve the acquisition process, it has labored under the burden of unfulfilled promises and difficulties in conclusively proving its benefits. Tarnished in some respects by its close identification with major programs, it has lapsed into a measure of obscurity in recent years.

The validity of the concept still stands. Multiyear became a well-developed concept with readily defined objectives and criteria established for its use. There are many notable advantages and disadvantages which are in turn influenced by a host of other variables. Historically, the concept was not as narrow as it is now rendered. DoD envisioned a more relaxed use which accepted the notion that errors would be made in applying it.

The usual multiyear perspective has been exclusively that of the Government's. The contractor point of view has not received as much attention as it should have. Industry has steadfastly shown an enthusiasm for the concept not often reciprocated by the Government. The reasons for this reside in both managerial and sociological settings. This brings a unique need to multiyear not often understood nor appreciated by the Government. A paucity of information exists on contractor concerns and their interrelationship with one another.

The next chapter will explore some of these relationships uncovered by a survey of prime contractors awarded a major system multiyear contract. Some of the problems and observations derived from multiyear mentioned throughout this

chapter will be scrutinized to discover similarities and divergence from accepted assumptions.

III. RESEARCH METHODOLOGY

A. PURPOSE

The goal of any research is to discover the truth. There may be many ways of pursuing the truth but they all share the basic assumption of causality and determinism related to antecedent events. An observer or researcher assumes his environment progresses in an orderly manner so each aspect of causality can be examined. The basic tool of use is the scientific method which mandates the identification of a problem, the formulation of a hypothesis, a series of observations, an analysis of data and finally the drawing of conclusions from the data. Hypothesis are tested and either retained and refined or discarded [Ref. 48:p. 10]. Research that has gone before forms the building blocks of all current efforts. Criticisms of past efforts are necessary and desirable and done not to ridicule but to illuminate the truth. Truth is revealed not so much in an instance but in the accretion of knowledge and the insightful discovery of patterns within that information. This effort is part of that accretion of truth which may shed light on the questions at hand.

The genesis for this research effort came from an incidental observation reported in a research study conducted by Bergjans & Elbroch on multiyear contracting in 1982 [Ref. 2:p. 155]. A perusal of similar research efforts in multiyear contracting showed only limited attempts to focus on contractor concerns or business practices influenced by multiyear contracting [Ref. 29 and Ref. 45]. The primary research question for this study was derived from an absence of data in this field and is an attempt to fill this void. Subsidiary research questions provide the direction and extent of this study.

B. RESEARCH DESIGN

Any research design is limited by the factors within the control of the researcher. Participants in this study came already assigned to a condition of having received a multiyear contract. With neither control over participant assignment to the basic condition nor influence over any independent variables, only three basic constructs of field research can be used to conduct research. These three are interview, natural observation, and questionnaire [Ref. 48:p. 170-173]. Since a population in excess of 30 contractors was to be considered, interview was not deemed an appropriate design to use due to its time and cost to administer. A natural observation was also deemed inappropriate due to the nature of the factors being studied. This left the questionnaire as the most likely method to be used in this research design. Benefits of a questionnaire are its relatively cheap cost to administer, tolerance and adaptability to inexperienced researchers, and flexibility in not requiring the presence of a researcher to administer. [Ref. 48:p. 149]

C. POPULATION SAMPLE SELECTION

Population sample selection is dictated by both the area of inquiry and to a lesser extent the research design selected. Obviously, if one is concerned with contractor perceptions of multiyear contracting, one must draw a sample population from contractors. This naturally leads to questions concerning who and what time frames are to be used. Previous studies concentrating on Government derived benefits from multiyear contracting were inconsistent in their sample population selections. One study randomly selected major defense contractors with no consideration given to whether these contractors had ever been awarded a multiyear contract [Ref. 2:p. 21]. A later study focusing on subcontractors drew a sample population from three contractors who had been awarded a multiyear contract at one time but made no attempt

to relate the questionnaire to previous experience [Ref. 29:p. 31]. A third study focusing on long-term contracting drew its population randomly from a contractor professional organization [Ref. 7:p. 51].

The problem shared by all of these studies was the failure to link opinions with specific experience. Contractors are already theoretically predisposed towards multiyear contracting [Ref. 18:p. 80]. Failure to assess contractor attitudes toward a specific multiyear contract might result only in the reflection of this reservoir of positive feelings. These data may or may not reflect the true experience of multiyear contracting. A better approach would be to draw a sample population from those contractors who had actually received a multiyear contract and assess its impact on business practices. This is the approach taken in this research effort.

1. Contract Selection

The sample population size was defined as contractors who had actually received a multiyear contract. Multiyear contracting since the 1960's has been used on everything from generators and folding chairs to fighter aircraft and tanks. The inclusion of all of these contracts would have expanded this research immensely. The researcher decided to limit the scope of this study to sample populations consisting of "major" defense contracts as loosely used in DoD Directive 5000.1 or those requiring Congressional approval. Major defense acquisitions have always been the driving force that has defined the conditions and limits of multiyear contracting. Lessons learned from contracts will either increase or retard the use of multiyear. By limiting the scope of the sample population, greater background information in the form of Congressional hearings, GAO reports and budget authority figures become available to compare and contrast information received from contractors. The number of

contracts or programs that fall into this category consists of 42 contracts in the period 1960 to 1981 and 53 programs from 1982 onward. [Ref. 11:p. II-1]

2. Time Frame Selection

A further refinement of which contractors should be included in the survey was imposed by time. Practical considerations required a revision of the sample population. One study had already attempted to look at cancellation aspects of multiyear contracting by examining all contracts between 1962 and 1981 and encountered great difficulty in obtaining information [Ref. 11:p. III-4]. An additional 13 years would do nothing to make any information more accessible. An upper and lower time limit was placed on programs to be considered.

A multiyear contract in place and functioning will provide more information than one just awarded. The question becomes at what point are some included while others excluded. Multiyear contracts may be placed for five years. The mid-point of the contract would be three years which should provide enough information to assess a contractor's perceptions of it. Working backwards from 1994, the upper limit for the inclusion of multiyear contracts in this study was set at 1991.

The lower limit was established by examining the environmental factors that might influence contractor perceptions. The year 1981 was a logical place to start since this was the beginning of the Carlucci acquisition reform initiatives that brought multiyear contracting once again into the limelight. Two factors conspired against using this date. The first was the likelihood that documentation or memories after a 13 year gap might not be extant. Second, the FAR became effective 1 April 1984. Contracts awarded before this date were based on the Defense Acquisition Regulations (DAR) which, while similar to FAR, might introduce extraneous

perceptions and opinions not relevant to today's environment. A compromise lower limit date of 1 October 1984, or fiscal year 1985, was chosen to coincide with FAR implementation. The time period 1985 to 1991 resulted in the identification of 30 programs for which multiyear contracting was proposed.

D. LIMITATIONS OF THE DESIGN

Ideally, a research design should be able to randomly assign subjects to an experimental and control group. Since the researcher does not have functional control over the variables observed in this study, a control group cannot be established. However, a contrast can be achieved and function like that of a control group by sending the survey to both parties to a multiyear contract. To validate contractor responses, this survey was sent to both a contractor population sample chosen from multiyear contracts as well as Government program management offices charged with overseeing that contract. Complementary answers received would indicate a common basis of understanding exits that may be used to resolve problems. Divergent answers would indicate a failure to communicate clearly that may cloud Government perceptions of contractors and make problem resolution all the more problematical. These areas would require further research to understand their dynamics.

A limitation of the design is found in its major strength; namely its reliance on specific contracts. Data gathered may not typify all major system contracts. If only a small number of participants respond, this may skew the final interpretation.

The final sample size was defined as those contractors and Government program offices who were involved with a multiyear major system contract between 1985 to 1991. This yielded a population size of 60 participants.

E. QUESTIONNAIRE CONSTRUCTION

The questionnaire was constructed in accordance with the factors listed in Table 3.1 to maximize return rates. Each item lists a corresponding factor that has been found to increase participant responses. Normally, questionnaire return rates average only 10 to 25%. [Ref. 48:p. 149] Due to the small population size of this survey, a minimum return rate of 33% was desired if conclusions were to have any relevance.

To impart to the respondents the impression that the questionnaire was important, prominence was given to its linkage with the Naval Postgraduate School. The School's name was used throughout as well as appearing on semi-official stationery. The survey questions requested over 62 pieces of information and length of the questionnaire was considered a major problem. An attempt to lessen its apparent length was made by subdividing it into sections and renumbering each question within each section. The cover letter was personalized by addressing the questionnaire to specific persons not titles or positions within an organization. This required an extensive number of telephone calls to identify contacts and addresses. Questions were worded as simply as possible with a multiple choice format predominating. An inducement in the form of a written follow-on executive summary was offered if respondents returned the questionnaire. Persons targeted to receive the survey were mid-level contractors and Government program managers or executives. Being mid-level managers they would in all likelihood delegate its completion to others but retain enough control and interest to assure it was completed.

QUESTIONNAIRE CONSIDERATIONS	
Item	Effect to Optimize Response
Sponsorship	Prestige tie in
Clarity	Clear/attractive wording
Length	Short
Cover Letter	Personalized
Ease of completing	Multiple choice
Inducements	Offer of something useful
Interest	Tie in to respondent
Respondent profile	Target literate subjects

Table 3.1 [Ref. 48:p. 149-150]

The questions covered in the survey were derived from the research literature. These were composed of approximately eight related interest areas. Some of these questions were repeated from questions in other studies which were either contradicted in the research literature or not asked of the proper audience (e.g., contractors who did not receive multiyear contracts). Questions were written as simply as possible with a preference given to multiple choice questions. A few questions were worded negatively to break up pattern answering. The researcher believed that with the questionnaire already at 10 pages, it was important to alleviate respondent frustration. Primacy was given to easing the burden on the respondent. Appendix C contains the questionnaire used for this study.

F. DATA GATHERING

Addresses of participants were obtained by calling the contractors and Government program offices identified with each program. All 64 surveys were mailed at the same time to targeted participants. A three-week response time was allowed although surveys continued to arrive up to two weeks past the deadline. Self-addressed, franked envelopes were included in

each package to ease response. Special provisions were made to receive fax responses should respondents choose to use this mode.

No unusual problems were encountered. Information that indicated four programs which were initially thought to have used multiyear contracting caused the exclusion of these responses.

G. CHAPTER SUMMARY

This chapter examined the factors considered in the selection of the research design, sample population size and creation of the questionnaire used. A discussion of those factors important to the successful use of any questionnaire was covered as well as how these were embodied in the final product. A brief recounting of the data gathering process was mentioned. The next chapter will discuss in detail the data and observations collected.

IV. QUESTIONNAIRE AND ANALYSIS OF RESPONDENT BACKGROUND

A. INTRODUCTION

The data analyzed in this study were obtained by use of the questionnaire reproduced in Appendix C. The objective of the questionnaire was to elicit information on multiyear contracting experiences for major system contracts. The general perceptions of all major system contractors when aggregated together should create an accurate picture of their commonality of experience under multiyear contracting. From this information, general observations can be derived that may provide value to the whole.

The primary focus of this study was on the industry perspective. This accounts for the wording of some questions which are seemingly slanted to a particular point of view. No attempt was made to judge the correctness or "truth" of these perceptions since the beliefs of the participants are probably more important as a motivator than an objective but unknown truth. However, the Government perspective was not ignored. To ensure the greatest degree of frankness possible, anonymity was assured to each respondent.

The essence of communication is to ensure that the message initiated by the sender corresponds as closely as possible with the message understood by the receiver [Ref. 49:p. 9]. Synchronization of contractor and Government responses should indicate at least understanding if not necessarily agreement on the conditions of their joint experience with multiyear. A subsidiary goal of this study was to bring out these perceptions of multiyear held by both contractors and Government with the hope that knowledge of each other's beliefs will result in fewer misunderstandings and more effective contracts.

B. QUESTIONNAIRE STRUCTURE

The questionnaire was divided into eight sections of similar or complementary questions. Section I was primarily administrative and relates to each respondent's background and familiarity with the subject material. The primary purpose for including these three questions was to provide a measure of confidence in the respondent's experience to provide adequate answers. It was postulated that the greater the experience the more reliable the information. Any response that indicated minimal experience such as no multiyear experience or less than one year's association with a program would have been cause for automatic elimination. This occurred in one instance.

Section II composed of nine questions sought to assess the reasons a program was selected for multiyear contracting as well as some of the environmental factors influencing that decision. Many of the responses in this section might be categorized as self-serving. If respondents were already predisposed toward a multiyear contract it would be logical to assume continued adherence. The purpose of including these questions was to verify this commitment and catch the occasional discordant voice that might offer some new insight on the weakness of the process. The effort to capture data on political influence was an attempt to fill a void in the research literature. A cursory reading of the literature provides anecdotal evidence of this influence but lacks any empirical statistics to verify it. Just one example of this influence was a Congressional attempt to add three major acquisition programs for multiyear contracting in the fiscal year 1989 DoD budget authorization bill without Service backing.

Section III contains seven questions which attempted to link general influences on contractor facilities with investment. The extent to which contractors benefit from multiyear contracting in such intangible areas as

competitiveness and industrial or technological competency is important but not very well documented. Assertions to the contrary, data are limited at showing whether the industrial base is really enhanced or maintained to any greater degree with multiyear than annual year contracting. Of equal concern was the degree that Government contracting policies had in actually affected contractor plant investment decisions. Profit policy embedded in the weighted guidelines recognizes the crucial role investment plays in contractor economic sustainability. The health of the industrial base as well as the continued viability of a large portion of DoD contracting is contingent on the continued existence, maintenance and expansion of contractor capabilities. Included were a series of questions which sought to assess the impact multiyear had versus annual year contracting.

Section IV concerns itself with program change throughout the life of a contract. A specific requirement of multiyear contracting is program stability so efficiencies and economies of scale can emerge. These five questions sought to ascertain the degree to which programs actually ascribed to this initial selection criteria. If most programs are not stable, this opens up the possibility of more leeway in using multiyear for moderately stable programs such as envisioned in the original Carlucci criteria.

Section V consists of 10 questions on subcontractor participation in multiyear contracting. It repeats to some extent subject areas found in other studies to clarify and contrast inconsistencies. As noted in Chapter II, the degree to which multiyear enhances subcontractor contracting opportunities is not conclusive. The purpose of this series of questions was to define more closely the flow down benefits, if any, to subcontractors as well as those enjoyed by prime contractors.

Section VI consists of 13 statements and two questions which frame the heart of the differences between multiyear and

annual year contracting. These statements sought to clearly differentiate the realities of each. Questions were composed to capture the strength of feeling ranging across a continuum of agreement to disagreement.

Section VII is a continuation of Section VI with the emphasis placed on more detailed questions concerning risk and profitability. This series of seven questions sought to develop a level of understanding of the degree of Government success in fulfilling contractor expectations on risk and profit. Government lack of knowledge in this area results in the misapplication of profit policies and failure to create adequate levels of contractor motivation.

Section VIII is composed of five questions that sought opinions and impressions of multiyear not adequately handled by previous sections and questions.

The responses provided by both industry and Government are discussed and presented in tabular form. Where rounding errors caused totals to be initially less than 100%, a remainder was added to the largest digit to compensate. When elaborations were provided, their content is discussed in general terms without reference to any particular contract.

C. RESPONDENT BACKGROUND AND EXPERIENCE

A total of 64 surveys were mailed out with half going to a Government program office and the other half to the contractor. Both contractors and Government program offices receiving a survey are listed in Appendix D. Of this number, 46 responses or 72% were returned, 24 from the Government and 22 from contractors. Not all the responses received could be used. Some were marginally complete while others indicated that a multiyear contract had not been issued even after Congressional approval had been obtained. To include all of these responses would have skewed the data unreasonably toward a "no answer" response. These were set aside with data and

comments from Section VIII of the questionnaire being the only portion used. This left a useable core of 28 responses, 14 each from the Government and industry, representing an adequate section of the original group. To break these responses down any further, such as by Service component or industry grouping, would have compromised the anonymity of the respondents and was not done.

Question B1 asked the respondents to classify the position they occupied in their organizations. These data are present in Table 4.1. The principal reason for including this question was to ascertain whether the correct audience was providing the data requested. Ideally, responses were desired from program management and contracting personnel since this group would have the most intimate knowledge of the particulars of a contract. The data show this was obtained in both instances. A majority of both industry and Government respondents were drawn from these two classes. Program management was most often cited by both with contracting running a close second.

B1. RESPONDENT POSITION OCCUPIED		
Ind	DoD	Category
36%	29%	Contracts/Procurement
57%	57%	Program Management
0%	7%	Business/Financial
0%	7%	Technical/Engineering
7%	0%	Other

Table 4.1

Question B2 presented in Table 4.2 displays data collected for time spent in the position cited in question B1. The rationale for asking this question was the same as that in B1 with the added assumption that the greater the time in a position the greater the degree of confidence would result in the data the respondent provided. The median experience level

of both Government and industry personnel was approximately the same. The category "over 10 years" was the experience level most often cited. When total responses are considered, industry personnel were much more experienced than their Government counterparts but not to any significant degree. Overall, the respondents to this questionnaire were very experienced in their fields indicating a high degree of confidence can be placed in their responses.

B2. RESPONDENT EXPERIENCE IN POSITION OCCUPIED		
Ind	DoD	Category
0%	0%	1 year or less
0%	7%	1 to 3 years
7%	14%	3 to 5 years
43%	29%	5 to 10 years
50%	50%	over 10 years

Table 4.2

Rounding out this series of questions was the degree to which respondents had been exposed or were experienced with multiyear contracting. Question B3 presented in Table 4.3 asked about length of experience with multiyear contracting. This question was intended to reveal whether respondents possessed the necessary background to comment authoritatively on multiyear contracting. As shown, respondents possess a substantial number of years of familiarity with multiyear contracting. The median experience time was between five to ten years for both industry and Government. This was less than the median general experience level with their respective organizations as noted in question B2. This is probably to be expected since more senior personnel would work the more involved contracting concepts such as multiyear. With time in grade these personnel would move up and be exposed to multiyear. It would be rare to find a person whose total years of experience were devoted exclusively to multiyear

contracting. Surprisingly, Government personnel possessed a greater level of multiyear experience than industry. The differences between the two were probably not significant.

B3. RESPONDENT EXPERIENCE WITH MULTIYEAR CONTRACTING		
Ind	DoD	Category
0%	0%	none
0%	7%	1 to 3 years
36%	21%	3 to 5 years
36%	36%	5 to 10 years
28%	36%	over 10 years

Table 4.3

D. CHAPTER SUMMARY

This Chapter examined the structure of the questionnaire used in this study as well as looked at the background of respondents. The results obtained from the background questions show the typical respondent worked in either program management or contracting, had an extensive amount of experience close to ten years with his organization, and had on average five years exposure to multiyear contracting. This description holds true for both industry and Government personnel. The next Chapter will continue data analysis of the multiple choice questions for multiyear contracting.

V. ANALYSIS OF PROGRAM, INVESTMENT AND STABILITY RESPONSES

A. INTRODUCTION

This portion presents data collected for Sections II, III and IV of the survey questionnaire. These sections correspond to multiple choice and fill in the blank questions concerning the selection of a program for multiyear, contractor incentives to invest in facilities and tooling, and the design stability of the program. Analysis of the information will be conducted and contrasted with Chapter II background data.

B. PROGRAM SELECTION

The first three questions are related and concern the selection process for major system acquisitions for multiyear contracting. The answers for multiple choice questions P1 and P3 were exactly the same with one lone exception. The lone exception indicated that the use of multiyear contracting was an attempt to strengthen a program vis-a-vis higher priority programs. The selection process for this program was a defensive decision not a positive affirmation of its suitability. The vast majority (93% industry and 100% Government) of all other respondents thought their programs were both good candidates for multiyear and had achieved its objectives in using multiyear. A breakdown of responses for question P1 is shown in Table 5.1.

P1. WAS THIS MAJOR SYSTEM A GOOD CANDIDATE FOR MULTIYEAR CONTRACTING?		
Ind	DoD	Category
93%	100%	yes
7%	0%	no

Table 5.1

When asked to elaborate why their programs had been good candidates for multiyear, contractor responses repeatedly mentioned three aspects: mature production, stable design, and

cost efficiency. Most noted that their programs had been in production a number of years before a decision was made to go multiyear. One individual mentioned four separate production runs while another noted his system had been in production for seven years. Stability of design was also a major attribute shared by all programs. A stable design minimizing the risk to both the contractor and the Government was mentioned pointedly by one contractor. Frequently mentioned were cost efficiencies associated with a stable design and mature production. One respondent noted that investment in plant equipment occurred as a direct result of these factors allowing a better price to be offered to the Government. Another cited his ability to enter into advance agreements with subcontractors as well as economy of scale purchases. In short, all of the economic aspects linked to cost efficiencies were mentioned in one form or another by all the industry responses. No mention was made of such things as savings in administrative costs, industrial base preservation or competitive advantage.

Government responses overwhelmingly agreed that the point that made their programs ideal for multiyear was stability, both in design and requirements. Other reasons were cited infrequently but in each case it was only by one respondent. One respondent even noted that his contract provided a wealth of "lessons learned" for his organization to embark on other similar projects. The efficacy of letting a multiyear contract for this purpose however seems debatable. Others stated that better control could be established over the process since multiple annual year contracts were avoided. This allowed a greater interface with the contractor than a series of annual year contracts.

Question P2 attempted to differentiate between the rationale that propelled a candidate to be selected for multiyear and the program's characteristics that might have been reason enough for its selection. Ideally, the two should

be the same but the motivation for one may not reside entirely with the characteristics of the other. For the programs under consideration, 64% of contractors cited to one degree or another cost savings as the reason for selection of their program for multiyear contracting. Another 29% cited other reasons such as program maturity or stability. One noted that the primary reason his program was identified was to protect the program from cancellation; a political decision if ever one existed. Government opinions cited numerous reasons for selection but all mentioned one universal factor: cost savings. The rationale for selecting a program and its inherent characteristics proven one in the same for the Government. Overall, Government and industry respondents perceived the nomination of their program as inherently an opportunity to reduce total program costs and nothing else.

Linked to program selection in question P3 was an evaluation as to whether the decision to use multiyear was ultimately proven correct or not. In all but one instance, 93% of contractors and Government respondents agreed that the decision to use multiyear had been vindicated. Table 5.2 presents this breakdown.

P3. WERE PROGRAM OBJECTIVES ACHIEVED?		
Ind	DoD	Category
93%	100%	yes
7%	0%	no

Table 5.2

Contractor comments made in the elaboration portion of this question indicated that the evidence of success was not found in the final number of items produced, delivery dates met, or fielding of completed units. It was found in cost savings alone. Cost or price reductions to the Government ranging from 12% to 48% were mentioned in almost all responses. Other benefits, such as continuous deliveries and

reliability were mentioned only in passing and secondary to cost savings. Government responses echoed the same measure of success as that of industry. Evidently, this one criterion becomes the measure of success whatever other reasons might also have motivated the decision to use multiyear. So strong is the need to prove financial savings that a program which later prematurely ended was claimed by its respondent to have achieved success since the item still resulted in a lower overall cost than its previous annual year contract.

The process by which a multiyear contract for a major weapon system is approved is a lengthy and involved process. Question P4 asked respondents to evaluate this process and determine who benefits most by it as well as to offer comments on the process. The rationale for asking this question was to determine the depth of satisfaction with the current process. Results are presented in Table 5.3.

P4. DOES THE CURRENT MULTIYEAR PROCESS SERVE THE INTEREST OF BOTH BUSINESS AND THE ARMED SERVICES, ONE OR THE OTHER, OR NEITHER?		
Ind	DoD	Category
72%	86%	benefits both
7%	7%	benefits the Government
0%	0%	benefits industry
14%	0%	benefits neither
7%	7%	unknown

Table 5.3

A majority of contractors (72%) and Government personnel (86%) thought both parties benefitted from the current process. However, neither were entirely pleased with the way the process works. Written contractor comments mentioned the annual year appropriation cycle as conflicting with the basic premise of multiyear contracting. Too many parties were involved in the process with too many chances for worthwhile programs to be disapproved. Others thought the process too

slow and in need of streamlining. One suggested an impartial third party pass judgment on the merits of nominated programs. Some industry comments recognized that multiyear uses substantial resources and decisions need to be made judiciously if new programs are not to be starved of money. Another stated that Congress should sign up to a FYDP and then allow the Services to execute it with the money provided for the approved plan whether this led to a multiyear contract or not. All would like to see greater commercial involvement in the decision process. Two negative opinions held that neither party benefitted from the current arrangement and mentioned many of the same things. One comment noted the redundancy of providing selection criteria to the Services and then conducting extensive reviews again upon programs that were nominated via these criteria. Another flatly stated that cost overruns were the result of unstable Congressional funding practices and Congress was the cause of lost savings from multiyear. Government comments were not as critical as that of industry although one program office stated that GAO was a part of the problem not the solution. Presumably this is in relationship to GAO's review process which labels program office estimates of savings, program stability, and requirements realism as either realistic or unreliable.

Question P5 concerns political considerations in selecting a major system for multiyear. As noted in Chapter II, there are both beneficial and negative effects from political intervention on behalf of a major system acquisition depending on the magnitude of the commitment and the timeline on which a program finds itself. One of these benefits is a form of protection against shifting priorities once a program has been approved for multiyear. Question P5 asked if a multiyear contract would have provided an element of this protection for the respondent's program. A majority of both Government and contractor respondents agreed that such protection would have been possible for their programs.

Combining all affirmative responses nets a result of some 93% expressing at least mild agreement with this statement. The implication is that some program managers are savvy enough to recognize that multiyear should or can be considered as an option beyond mere cost effectiveness. Program survivability can also be enhanced by using it. Earlier written comments seem to indicate that while none of the current respondents have done so, they suspect that multiyear may have been promoted by some for political purposes alone. Results are shown in Table 5.4.

P5. WOULD A MULTIYEAR CONTRACT HAVE PROVIDED GREATER PROTECTION AGAINST SHIFTING POLITICAL INTERESTS?		
Ind	DoD	Category
36%	57%	yes, strongly agree
57%	36%	yes, but only mildly agree
0%	7%	neutral/maybe
0%	0%	no, mildly disagree
7%	0%	no, strongly disagree

Table 5.4

Program managers must believe in the merits of their own programs since they are its primary advocate. Question P6 attempted to assess the degree a respondent's program may have invoked or benefitted from political considerations when deciding whether to use multiyear. At least half of the Government personnel shown in Table 5.5 tended to agree at least mildly that the choice to use multiyear was somewhat of a political decision for their programs. Contractor personnel felt approximately the same way but by a smaller margin.

P6. DID POLITICAL CONSIDERATIONS PLAY A PART IN IDENTIFYING THIS SYSTEM FOR MULTIYEAR CONTRACTING?		
Ind	DoD	Category
14%	7%	yes, strongly agree
29%	43%	yes, but only mildly agree
29%	29%	neutral/maybe
14%	0%	no, mildly disagree
14%	21%	no, strongly disagree

Table 5.5

Question P7 repeats the premise of question P5 but approaches the matter of influence from a budgetary perspective instead of political consideration. The thought here was that not all budget decisions are influenced by a political calculus alone since DoD and the President must prepare a budget based on the FYDP. The question becomes one of whether a multiyear contract would have provided greater protection for financial resources allocated to a program. Theoretically, based on the stable funding requirement for multiyear programs, this should occur. Not surprisingly then, 96% of all respondents agreed that this would occur. As shown in Table 5.6, there is little disagreement between contractors and the Government on this point. The one negative response was from a program subjected to great political pressure.

P7. WOULD A MULTIYEAR CONTRACT HAVE PROVIDED PROTECTION AGAINST SHIFTING BUDGET CONSIDERATIONS RESULTING IN GREATER PROGRAM STABILITY?		
Ind	DoD	Category
64%	57%	yes, strongly agree
36%	36%	yes, but only mildly agree
0%	0%	neutral/maybe
0%	0%	no, mildly disagree
0%	7%	no, strongly disagree

Table 5.6

The research literature is filled with positive contractor and Government testimonials to multiyear as well as the benefits that are to accrue to each when it is used properly. Question P8 attempted to assess whether working with a multiyear contract would encourage Government and contractor personnel to want to do so again. The majority of respondents seemed to be ambivalent toward the process and would be happy to see either contract type, annual or multiyear, used again if given an opportunity. Surprisingly, despite the great enthusiasm often expressed by contractors for the process, Government personnel indicated a greater preference for using multiyear contracting again than did their contractor counterparts as shown in Table 5.7. Perhaps the most telling response of all is that while many would welcome either contract choice, none of the respondents desired only to see an annual year contract used exclusively if their original system were to be procured again. Only one negative response was received from a Government program office that would not want to see multiyear used again. This comment was more supportive of multiyear than negative since the program under consideration did not meet multiyear's original economic quantity lot criterion.

P8. IF GIVEN AN OPPORTUNITY TO PLACE/RECEIVE A CONTRACT OF THE SAME TYPE FOR THE SAME MAJOR SYSTEM, WOULD YOU DO SO?		
Ind	DoD	Category
29%	43%	yes; only with a multiyear contract
0%	0%	yes; only with an annual contract
71%	50%	yes, with either a multiyear or annual year contract
0%	7%	no

Table 5.7

Question P9 asked whether the program cited resulted in a multiyear contract, and if not, why not. This question was

included for two reasons. The first was as a check to ensure that only those programs which had actually been awarded via a multiyear were included in the data base. This question eliminated two partially completed responses that might have been included otherwise. The second was to ascertain why programs that had passed the approval stage were either turned down or considered later as not appropriate. Two reasons were given most often by those whose programs had been approved by Congress. The primary reason cited was a cut or elimination of projected funding. The second was a reduction in program quantities due to the military downsizing and the consequent loss of cost efficiencies. Most of these programs then reverted to annual year buys.

C. FACILITIES AND INVESTMENT

One of the attributes of multiyear is its ability to generate a greater degree of plant investment than would have been achieved with an annual year contract. The first two questions in this section relate directly to this point.

Question F1 asked the respondents to quantify the amount of the investment made in plant and equipment as a direct result of their multiyear contract. A wide variety of answers were provided by both Government and industry as well as many "unknown" responses. Less than a third of the Government respondents and about half of the contractors provided an answer. Of those received, the average for the Government was close to $104.6 million. The investment figure provided by contractors averaged close to $36 million. The contractor estimate may have greater credence since they are closer to the source of the decision as well as privy to verifiable data. Without additional inquiry or qualification to the numbers, the exact figures cited should be considered unreliable. Another problem with the number reported is that the magnitude of investment that might have occurred on a similar annual year contract is difficult to estimate. Still,

what can be taken as reliable is that investment has and does occur solely as a response to multiyear contracting. Table 5.8 shows the data reported categorized across a spectrum of the answers provided.

F1. WHAT WAS THE DOLLAR LEVEL OF INVESTMENT IN PLANT AND EQUIPMENT STIMULATED BY THIS MULTIYEAR CONTRACT?		
Ind	DoD	Category
7%	7%	$1 million or less
21%	14%	$1-10 million
14%	7%	$10-50 million
14%	7%	$50-100 million
44%	65%	unknown

Table 5.8

Previous studies have documented the impact multiyear has had on investment decisions. GAO in a survey of prime and subcontractors noted that 81% (213 of 263) of subcontractors were influenced to increase their spending on capital investments because of a multiyear contract. Information on prime contractors was positive but not as overwhelming as that of subcontractors with only two of six primes being similarly influenced [Ref. 28:p. 17]. Another study also confirmed that 54% of contractors thought productive capacity was likely to increase because of multiyear [Ref. 45:p. 37]. Undoubtedly investment will occur under multiyear but it would also occur under an annual contract as well. Important to resolving the question of multiyear's impact is to determine what, if any, might have been an annual year's impact. In this way, both sides of the issue may be examined.

Question F2 sought to cast light on multiyear investment by examining the influence annual year may have had on the same program. The greater the negative response to this question, the greater the agreement should be for multiyear's influence. Not surprisingly, both parties indicated that

annual year contracting's influence on investment was inferior to that of multiyear's. A majority of both (50% contractor, 64% Government) felt that at best if their programs had been awarded as annual year contracts, investment might have achieved the same level as multiyear. Significantly, a large number (35% contractor, 29% Government) clearly believed an inferior investment rate would have been achieved. By extension, these figures confirm previous research that multiyear does a better job of motivating investment than an equal number of annual year contracts would have. Table 5.9 presents the results.

F2. WOULD CONTRACTOR PLANT AND EQUIPMENT INVESTMENT HAVE BEEN GREATER IF THIS CONTRACT HAD BEEN AWARDED AS ANNUAL CONTRACT INSTEAD OF MULTIYEAR?		
Ind	DoD	Category
7%	7%	yes, much more than expected
7%	0%	yes, slightly more than expected
50%	64%	no, about the same
36%	29%	no, less than expected

Table 5.9

Equally important to making any decision to invest is the probability of recouping the costs. The magnitude of each investment decision must be weighed against the risks involved. If risks are too high, the amount of the investment is reduced. The rationale for asking question F3 is to find out whether the multiyear business environment is conducive to making these decisions. If so, a majority of responses should concede that investments were sufficiently amortized. If not, negative responses should predominate. The results shown in Table 5.10 confirm that a majority of both respondents felt that investment costs were successfully amortized. Adding together all affirmative responses, 79% of contractors and 86% of Government personnel agreed that amortization of start up costs and capital investment was achieved to the degree

desired by the contractor. The rest of the respondents either did not know or disagreed on the effect.

F3. WAS AMORTIZATION OF START UP COSTS AND CAPITAL INVESTMENT ACHIEVED TO THE DEGREE DESIRED BY THE CONTRACTOR?		
Ind	DoD	Category
50%	50%	yes
29%	36%	yes, but with some reductions
7%	0%	no, but some benefits were achieved
0%	0%	no
14%	14%	unknown

Table 5.10

There are two principal reasons for the Government to encourage investment in plant equipment. The first already mentioned is to achieve a level of production efficiency that will be reflected in a lower unit price. The second is to strengthen the industrial base and encourage investment in new technology. This may ultimately result in breakthroughs which will likewise have a meritorious effect on unit price and quality. Questions F4 through F6 focused on this aspect of investment related to technology.

Question F4 asked whether plant equipment and facilities created to support a major system acquisition still exists. The rationale behind this question was to explore to what degree the investment encouraged by multiyear was a permanent condition or a passing phenomenon with capital and equipment scattered after contract completion. Table 5.11 shows that 79% of both industry and Government agree that the industrial capacity created still exists in full. Taking all contractor responses into account, the data show that the capability created still exists. Caution must be applied to the interpretation of these data. The oldest contract cited in this study would have begun in 1985. Downsizing of the military did not begin in earnest until the early 1990's so

there may still be a holdover effect from that era that retains this industrial capacity as a purposeful corporate strategy. Nonetheless, the resiliency of this capacity through the end of 1994 is notable.

F4. DOES CONTRACTOR PROVIDED PLANT AND FACILITIES/CAPITAL INVESTMENTS MADE FOR THIS CONTRACT STILL EXIST?		
Ind	DoD	Category
79%	79%	yes, in full
21%	7%	yes, but not in full
0%	7%	no, but with some residual capacity
0%	0%	no, it no longer exists
0%	7%	unknown

Table 5.11

Question F5 approached the question from another angle. The thought was to assess to what degree the contractor's technological sophistication might have changed because of a multiyear contract. A longer production cycle should encourage learning which theoretically translates into greater understanding in the application of technological solutions. An opposing point, equally valid, might be that multiyear requires the freezing of both the design and the technology needed to manufacture a product. The producing contractor might then fall behind his competitors who would be free to explore more sophisticated, technological solutions. The data presented in Table 5.12 show some 36% of contractors expressed agreement that multiyear did enhance their technological capability while 21% of Government responses felt the same. More significantly, 57% of contractors and 79% of Government felt that multiyear had only a marginal or no effect on this capability. Clearly multiyear does not provide a technological boost by itself in most cases.

F5. WHAT WAS THE TECHNOLOGICAL LEVEL OF THE CONTRACTOR'S PRODUCTION FACILITIES AT THE END OF THE MULTIYEAR CONTRACT?		
Ind	DoD	Category
36%	21%	greater, and due to multiyear
36%	29%	greater, but not due to multiyear
21%	50%	about the same
7%	0%	less, but not due to multiyear
0%	0%	less, and due to multiyear

Table 5.12

The contribution multiyear had on the preservation of the defense industrial base was queried in Question F6. As noted elsewhere, this effect has been one of the cardinal tenets sustaining interest in multiyear. As might be expected, a majority (86%) of contractors expressed an affirmation of its influence. A majority of Government program managers (79%) also expressed agreement but not to the level of confidence held by contractors. What was surprising was that most contractors thought the impact was major (65%) while most Government responses (58%) thought the impact was best categorized as small. Results are summarized in Table 5.13

F6. DID THIS MULTIYEAR CONTRACT CONTRIBUTE TO THE PRESERVATION OF THE DEFENSE INDUSTRIAL BASE?		
Ind	DoD	Category
65%	21%	yes,it had a major impact
21%	58%	yes, in some small way
7%	7%	maybe
7%	14%	no, it had only a negligible impact
0%	0%	no, not in the least bit

Table 5.13

Respondents were asked to comment or elaborate on their answers given on multiyear's impact on the industrial base.

The reasons cited, or rather not cited, form a distinct pattern. Few if any of the contractors who thought multiyear had a major impact cited any reason for it. It seemed to be an article of faith that multiyear did have an impact, so there was no need to explain how or why it occurred. If a reason were cited as occurred in three cases, the explanation was only a recitation of multiyear's benefits, such as lower costs. One contractor stated that his multiyear contract delayed the movement of his commercial work to another site. The presumption here was that he stayed with Government work longer than expected and in this way the industrial base was kept "warm." Government responses fell into the same pattern of not citing specifics to support their response. Three negative responses, two Government and one contractor, were received. Both Government program offices thought multiyear had no impact on the industrial base since only one contractor could have won the contract. Since a monopoly existed, it made little difference to the industrial base what type of contract was awarded because tooling and the like already were being used. The negative contractor response was not explained.

Finally, the last question in this section explored the impact the cancellation ceiling had on investment. As noted in Chapter II, a cancellation ceiling may be viewed as "insurance" against risk, freeing a contractor to invest up to its maximum limit. Question F7 sought to assess whether a large cancellation ceiling acted as a motivator for investment or not. The results presented in Table 5.14 decisively show that contractors agree by a margin of 71% that it has no effect whatsoever. Fifty percent of Government respondents also agree on this point. A notable portion (36%) of the Government responses viewed the cancellation ceiling as having some positive benefit as opposed to only a few contractors (14%) who felt the same way.

F7. DID A LARGE CANCELLATION CEILING IN THIS MULTIYEAR CONTRACT TEND TO EXPAND PLANT INVESTMENT?		
Ind	DoD	Category
50%	50%	yes
29%	36%	yes, but with some reductions
7%	0%	no, but some benefits were achieved
0%	0%	no
14%	14%	unknown

Table 5.14

D. PROGRAM STABILITY

Program stability is one of the critical criterion used in the nomination and selection process for multiyear contracting candidates. GAO, in their review of annual multiyear candidates submitted to Congress, regularly comments on this feature. The purpose of asking questions on stability in this study is to assess after the applicability of this major criterion.

FAR requires the use of Value Engineering Change Proposals (VECPs) prior to the initial production of any major weapon system. VECP programs contractually motivate industry to submit engineering changes by allowing them to share in a portion of the savings that result from reduced program costs created by engineering efficiencies. These are to be encouraged as long as some cost savings are achieved. However, numerous Engineering Change Proposals (ECPs), as opposed to VECPs, may signal program instability and the failure to abide by FAR's screening process. On the other hand, instances of instability in successful programs as reflected by the number of ECPs generated may indicate a too rigid exclusion of all unstable programs is neither possible nor desirable. The original Carlucci criteria for multiyear selection recognized that some unstable items required management flexibility to determine if they could still be

successful multiyear candidates. The significance of finding instability in successful programs is that it broaches the question of what should prevail in the selection process: greater management flexibility in selecting programs or a rigid exclusionary criterion?

Even a thoroughly examined or stable design should generate a few ECPs. An unstable design on the other hand should generate a considerably greater number of both VECPs and ECPs. ECPs of all kinds become for all practical purposes a shorthand designation of program stability. Question S1 asked how stable was the design of the item under contract in view of the number of ECPs generated. A majority (79%) of contractors indicated that their programs were stable with only minor variations occurring. Only a few programs (21%) were noted as being unstable resulting in a direct impact on manufacturing and buying processes. The Government response showed a similar but higher pattern of stability with 93% responding that only minor variations occurred. These data are presented in Table 5.15. The stability of most programs was very high vindicating the selection criterion used in FAR for stability. But a small number still managed to generate changes despite program selection criterion that should have minimized these occurrences.

S1. HOW STABLE WAS THE DESIGN OF THE ITEM(S) UNDER MULTIYEAR CONTRACT?		
Ind	DoD	Category
7%	0%	very stable, few ECPs
29%	36%	fairly stable, minor ECPs
43%	57%	stable, some ECPs
21%	0%	not stable, ECPs with direct impact
0%	7%	unstable, many ECPs

Table 5.15

Question S2 sought to examine whether ECPs had a material impact on the contract by increasing total contract costs for scrapped material. Multiyear's ability to influence economic order quantity procurement months, if not years in advance of actual need has the potential of increasing costs by purchasing material that might not be used if changes occur in design. Even conceding the possibility of this occurring, the dollar magnitude of these changes must be balanced against the beneficial effects time grants in correcting problems before they become incorporated into the end use item. The rationale for asking this question was to assess whether changes brought about through either ECPs or programs, such as VECP, aimed at reducing costs in annual year contracts had the same or a detrimental effect when used in conjunction with a multiyear major system acquisition. The results are presented in Table 5.16. A majority of contractors agreed (58%) that ECPs did result in material being scrapped thereby increasing contract costs but only to a small or an insignificant degree. This is in contrast to 65% of Government responses from program offices which thought that if ECPs did occur, they had little or no material impact on their contract. Clearly the differences do not rise to the level of statistical significance but it does cast some doubt on the workings of ECPs on cost.

S2. DID ECPs RESULT IN MATERIAL BEING SCRAPPED THEREBY INCREASING CONTRACT COSTS?		
Ind	DoD	Category
0%	7%	yes, it happened frequently
58%	14%	yes, but it happened rarely
21%	65%	no, any costs were absorbed
21%	14%	no, ECPs did not increase costs

Table 5.16

Question S3 sought to quantify the value of ECPs to assess whether the changes which did occur were of any significance. This question read together with S2 should provide insight on whether these changes should be cause for concern. If the impact of these changes is significant, then a reassessment of the need to enforce program stability may be required. If major cost increases do occur, this bolsters the argument for allowing only the most stable programs to use multiyear. A level of insignificant cost occurrences would tend to support an argument for possibly loosening some of the strict program stability requirements. Unfortunately data are not sufficient to reach a conclusion. The majority of respondents possessed little or no data on the cost of changes nor the percentage these costs represented as a proportion of the whole contract. The greatest cost cited was $12 million which represented less than .8% of total program costs with the smallest at $50,000 or .1% of the total.

The last question regarding ECPs sought to identify who initiated engineering change. Change can be either positive, in the form of a VECP program, or negative resulting from rushing a design into production. The nature of Government and contractor engineering changes are different. Generally, changes made by the Government result from efforts to enhance or complicate the design. This is a result of trying to optimize a vast number of end user needs. A great number of these changes during production would support a conclusion of design instability. Changes made by the contractor are usually in the nature of simplification to reduce material costs especially if a form of fixed-price contract is used. This results from the contractor trying to rationalize his matrix of production decisions. Numerous contractor suggested changes might tend to support a presumption of cost savings from a VECP or similar program. Costs incurred in pursuit of total cost reductions are to be encouraged versus costs incurred in pursuit of the ultimate design or "goldplating."

The results of question S4 are presented in Table 5.17. Generally, the results support a conclusion that most changes primarily involve the contractor. The percentage of contractor and Government respondents that believe change was initiated equally is 29% and 57% respectively. The percentages that state the contractor primarily initiated change are equally close at 43% for the contractor and 36% for the Government. These figures tend to support a conclusion that the changes were beneficial to the program and are in the nature of cost savings.

S4. WHO INITIATED THE MAJORITY OF ENGINEERING CHANGE PROPOSALS?		
Ind	DoD	Category
7%	0%	Government
7%	0%	primarily the Government
29%	57%	both equally
43%	36%	primarily the contractor
14%	7%	contractor

Table 5.17

The last question on program stability appearing in the questionnaire concerns delivery schedule. Multiyear contracts commit the Government to a given number of items to be produced over a set period of time. As noted in Chapter II, the Government, while often slow to enter into a multiyear contract, rarely exercises the cancellation clause unless a major problem occurs. Next year funding becomes a given except in those rare instances, such as current efforts to downsize the military. With funding secure, a lengthening of a program's delivery schedule should not occur. If it does, it may be symptomatic of a more deep seated cause such as design instability, production problems or a failure to meet performance criteria. Regardless of its exact cause, the

existence of this problem can also be used as a shorthand evaluation of a program's overall stability.

Table 5.18 presents information on question S5 that asked whether a major system program's delivery schedule got stretched out. On average, both industry and Government indicated that 43% of programs suffered some measure of delay. The responsibility for the delay in the majority of cases rested equally with both the Government and contractor, although the Government was more likely to view things as being the contractor's fault.

S5. DID THE DELIVERY SCHEDULE FOR YOUR PROGRAM GET STRETCHED OUT?		
Ind	DoD	Category
14%	7%	yes, delay rests with Government
29%	21%	yes, delay rests with both
0%	14%	yes, delay rests with contractor
0%	7%	no, only minor delays
57%	51%	no, it kept to its timetable

Table 5.18

When asked to elaborate on the reasons for delay, Government responses tended to stress economic factors. Government respondents mentioned the need to maintain a warm production line for receipt of additional orders, both domestic and foreign military sales. By avoiding a break in the production line, total overall cost for the program as opposed to per contract could be reduced. Contractor explanations also mentioned economic reasons about half of the time. Fully half of the responses mentioned some kind of failure related to design stability. Often mentioned were a Government desire to enhance end product capability, increased combat survivability, and the failure of Government provided equipment used in conjunction with the end item testing. On a more positive note, despite these problems, fully half of

the programs kept to their timetables. This indicated that while instability does occur, on the whole it does not rise to a major problem. These data are confirmed by the responses to a number of other questions in this section.

The conclusion is that instability usually results from an effort to achieve cost savings or other economic factors and not pernicious design programs. When problems do occur they can still be managed effectively and the full effect of multiyear economic benefits still obtained.

E. CHAPTER SUMMARY

This Chapter examined several multiyear issues. The foundation of how programs are selected and influenced was discussed. The selection process originates as a means of achieving cost savings but often becomes enmeshed in political considerations. These considerations may not stress cost savings to the degree desired by both industry and Government. Contractor investment decisions are influenced by cancellation ceilings but only marginally so with risk assessment the greater determinant. Contractors do see their multiyear investments conferring a measure of technological advantage as well as helping to preserve the defense industrial base. Most multiyear programs do contain an element of instability but the degree is small in most instances. When changes do occur it is primarily initiated by the contractor. Those changes are typically of a small dollar value relative to the cost of the total contract but do have a tendency to increase program costs slightly. The next Chapter will continue the data analysis focusing on the conduct of multiyear contracts.

VI. ANALYSIS OF SUBCONTRACTING, CONTRACT CONDUCT AND RISK

A. INTRODUCTION

This Chapter continues the analysis of questionnaire responses in the areas of subcontractor participation, the conduct of actual multiyear contracts and risk. Comparisons with previous subcontractor studies will be made to highlight differences and agreements.

B. SUBCONTRACTOR PARTICIPATION

Subcontractor participation in multiyear contracting has been the primary focus of at least two past studies [Refs. 29 and 34] as well as cited in numerous others. The rationale for examining subcontractor participation in this study was to trace the flow down effects of multiyear contracting. The flow down effect may be defined as the financial and industrial reverberations throughout the economy that passes from one tier of contractors to another. The end result of this effect is similar to the relationship of money changing hands to the economic health of an economy. The greater the impact multiyear has on subcontractors, the greater the enhancement and strength imparted to the defense industrial base as a whole.

The intent of this series of questions was to obtain a prime contractor's perspective on multiyear's effect on subcontractors. Throughout this Chapter two studies will be mentioned frequently when subcontractors are discussed. The first by Anthony M. Dovie sought to distinguish the viewpoints held by prime and subcontractors toward multiyear contracting [Ref. 29]. Some of the conclusions of that study are open to question since a very small number (three) of prime contractors provided input. This study builds on Dovie's work and closes the data gap on prime contractors' perceptions from that study. The second study often mentioned will be that of

James C. Madrid on subcontractor opportunities under multiyear contracting.

The first question in this section (K1) asked whether a multiyear contract would result in greater interest from subcontractors than would a similar annual year award. The rationale for asking this question was to document the quantitative difference in the two methods to elicit interest. Ultimately, increased interest may result in the opportunity for more competition and lower prices. Due to multiyear's length of time and possible dramatic influence on the economic life of a company, an intuitive answer should be that it will generate more responses. The results in Table 6.1 confirm this. Looking at all affirmative contractor responses, 86% felt that the interest level generated was greater than an annual year contract. Government responses concurred on this point but not to the level of intensity voiced by contractors.

K1. DID THIS MULTIYEAR CONTRACT RESULT IN GREATER SUBCONTRACTOR INTEREST AND COMPETITION THAN A SIMILAR ANNUAL CONTRACT AWARD?

Ind	DoD	Category
65%	29%	yes, greater than expected
21%	57%	yes, but only slightly
14%	0%	no, about the same
0%	0%	no, less than expected
0%	14%	unknown

Table 6.1

Elaboration comments were requested for this question. Responses received from contractors emphasized a number of different things with no one dominant comment mentioned most often or by all. One contractor noted that competition was greater because his subcontractors realized that if they were shut out of this competition they were effectively out of the running for a number of years. Still another observed that subcontractors were attracted due to the promise of greater

long term planning. This long term planning meant financial stability for the subcontractors for a number of years. Others commented that the increase in competition which resulted led to the development of new sources and the rekindling of competition with established sources. This in turn led to reduced prices. The few Government comments received also mentioned the same general observations.

The next question (K2) sought to establish if different award criteria were used for multiyear than would have been used on an annual year contract. The rationale for asking this question was to assess whether a conscious decision was made to vary subcontractor award criteria to match that of the prime. This would in effect transfer not only a portion of the risk but the benefits as well to subcontractors. A majority of both industry and Government responses agreed that differences in awarding subcontracts did occur. Twenty one percent of contractors thought the process was entirely different while 43% agreed that any differences that did occur were small. Up to 29% of the Government responses felt that the process was entirely different with only 21% thinking any changes were at best only minimal. Both the Government and contractors agreed at 36% that the process was essentially the same. The results are shown in Table 6.2.

K2. WERE THE AWARD CRITERIA ON SUBCONTRACTS DIFFERENT THAN THOSE USED ON SIMILAR ANNUAL YEAR CONTRACTS?		
Ind	DoD	Category
21%	29%	yes, entirely different
43%	21%	yes, but only a little different
36%	36%	no, essentially the same
0%	14%	unknown

Table 6.2

Comments were also sought on question K2. A number of things were mentioned that accounted for differences. One

contractor noted that his company used more winner-take-all contracts as well as allowing their subcontractors to buy more advance material. A few contractors volunteered the fact that multiyear contracts were also used with subcontractors sharing both the benefits and the risk. The consensus seems to be that when the criteria were changed, they were changed to magnify or solidify the economic advantage or impact on the prime's multiyear contract. In other words, the potential economic advantage conferred on the prime by a multiyear contract was realized only by negotiating price breaks and economic lot order purchases with his subcontractors. Subcontractors also benefitted from stable production runs and guaranteed business. Government responses indicated a heightened concern with the prime contractor's selection processes. Since the Government had no privity of contract with subcontractors, the best the Government could do was to provide greater scrutiny of the prime contractor's purchasing system to ensure it operated properly.

Question K3 sought to establish if the award of subcontracts took longer than would have been expected under an annual year contract. There is evidence in the research literature suggesting that the initial administrative time to award is greater but that the resulting benefits outweigh the initial investment in time. If the time to award is longer, this could delay contract implementation for the prime as well as any subcontractor. A delay in implementation results in increased prime contractor costs. If the time is the same or less, then a reason for not using multiyear is removed. The results in Table 6.3 indicate that about half of contractor respondents (58%) believe multiyear does not require them to expend more time in negotiating their subcontracts, and when it does, the burden is not significant. The raw number of Government responses showed no trend with responses spread amongst all possibilities.

K3. DID IT TAKE LONGER TO AWARD SUBCONTRACTS ON THIS MULTIYEAR CONTRACT COMPARED TO AN ANNUAL CONTRACT?		
Ind	DoD	Category
21%	14%	yes, longer
21%	21%	yes, but only a bit longer
51%	21%	no, about the same
7%	14%	no, faster than an annual year
0%	30%	unknown

Table 6.3

Comments were also asked for the responses given in question K3. Most contractor comments agreed that it took less time to award a subcontract under multiyear than a similar subcontract under an annual year even though the multiple choice responses were split about even. One response that fell into this category stated that slow Government up-front funding of his contract extended the time to award his subcontracts but once funding occurred they went into place quickly. Another commented that the time would have been the same except for increased DCAA audits and the need to prepare and provide extensive cost and pricing data. Those who felt the process was quicker than normal mentioned the ability to rely on a supplier base already established by previous annual year contracts for the same item. The one respondent who thought the process was quicker than normal stated that this occurred because subcontractors had eagerly lined up to do business cutting his award time sharply. Those contractors who felt the process was definitely slower mentioned the increased complexity of contract terms. The best remark came from an industry official commenting on the complexity and opportunity of multiyear: "EOQ really confused all of us!" The few Government comments mentioned complexity as the one element that slowed subcontract awards. Quicker awards were possible from an established vendor base created by previous

annual year contracts as well as greater program stability. One Government respondent cited the greater use of auditors as a benefit for speeding subcontract award; just the opposite perspective from one of the contractor comments.

Question K4 is related to question K3. Whereas, the latter was concerned with time, the former focused on the cost of subcontracting under multiyear. Once again the rationale for asking this question was to determine if multiyear was an impediment to the subcontracting process by increasing overall costs. The data presented in Table 6.4 indicate overwhelmingly that it is not. Ninety-three percent of contractors believe that the costs were the same or less compared to that of an annual year contract. Government responses were the same with 72% agreeing with this position.

K4. WERE SUBCONTRACTOR MANAGEMENT AND MONITORING COSTS PER YEAR GREATER THAN A COMPARABLE ANNUAL CONTRACT?		
Ind	DoD	Category
0%	0%	yes, greater
7%	7%	yes, but only a bit more
36%	36%	no, about the same
57%	36%	no, fewer than an annual year
0%	21%	unknown

Table 6.4

Comments were also solicited on question K4. These essentially came down to one thing: while initial costs might be higher to place subcontracts, the use of a multiyear contract encourages the prime to award his subcontracts as multiyear contracts. This means an avoidance of future costs plus achieving savings on future resolicitations. One Government comment noted that the lack of resolicitation costs resulted in lower overhead pools being applied to his contract. Many noted that the monitoring of subcontracts under a multiyear contract was the same as any other contract.

FAR encourages contracting officers to influence prime contractors to use multiyear contracts with their subcontractors. In this way the economic benefits of multiyear are flowed down. Question K5 attempted to assess the degree this actually occurred. Data presented in Table 6.5 indicate that the award of a prime multiyear contract results in the award of at least some multiyear subcontracts. All of the contractors stated that at least some multiyear subcontracts were awarded. Since multiyear requires a steady, reliable source of supply, it may be logical to assume that multiyear subcontracts will always be the most advantageous instrument for the prime to use to protect himself from work stoppages.

K5. WERE MULTIYEAR CONTRACTS WITH SUBCONTRACTORS CONSIDERED?		
Ind	DoD	Category
93%	50%	yes, and many were placed
7%	7%	yes, but only a few were awarded
0%	0%	yes, but none were awarded
0%	7%	no, it was not considered
0%	36%	unknown

Table 6.5

One of the results of a longer term relationship is the opportunity for both prime and subcontractors to work out problems and improve the quality of a product. Question K6 sought to assess the occurrence of this supposition by asking if quality were better than could have been achieved on an annual year contract. The results do not bear out this initial supposition. A majority of contractors (64%) felt that subcontractor quality for their multiyear contract was about the same as an annual year contract. About a third (36%) did experience some improvement but the results were not dramatic. Government responses were evenly split with 43%

feeling improvement in quality had been achieved while the same percentage felt it had not. Few comments were made that might cast light on why a majority might have answered the way they did. It is possible that quality had already risen to a high level due to previous annual year contracts. One telling remark from a Government official best summed up another possibility: "The people doing the work, where quality begins, probably had no idea what kind of contract was in place." Data for question K6 are presented in Table 6.6.

K6. WAS SUBCONTRACTOR QUALITY ON THIS MULTIYEAR BETTER THAN EXPECTED ON A COMPARABLE ANNUAL CONTRACT?		
Ind	DoD	Category
7%	14%	yes, greater than expected
29%	29%	yes, but only a slightly better
64%	43%	no, the same
0%	0%	no, worse than an annual contract
0%	14%	unknown

Table 6.6

Questions K8 through K10 sought to document the magnitude of subcontractor participation in multiyear. This is shown in Table 6.7. The degree to which prime contractors subcontract their multiyear contracts is not well-documented. While multiyear has been linked to increased subcontractor interest, the degree to which this participation continues past the end of an instant contract is unclear. This point is important in determining the long-term effects on future competition and the stability of prices. Question K8 sought to answer whether new sources of supply generated by a multiyear contract translates into a continuing business relationship. Of the 78.6% of prime contractors who responded, they reported on average that 62.7% of their new sources of supply were still doing business with them. The range was from a low of 0% to a high of 90%. Government figures were similar but must be

discounted since only a quarter responded with anything other than "unknown." Question K9 sought to assess the dollar amount of work that was subcontracted out while K10 sought to assess the percentage of that work awarded via a multiyear contract. Contractors reported on average that 53% of the value of their contracts were subcontracted with figures ranging from 25% to 75%. The percentage of this awarded on a multiyear basis averaged 58% with a range from 15% to 100%. Government responses for K9 were similar at 47% for the two-thirds of respondents who provided data. The Government response on K10 must be discounted again since less than half provided anything other than "unknown."

SUBCONTRACTOR PARTICIPATION STATISTICS			
	Question	Ind	DoD
K8	New sources of supply still doing business with the prime	62.7%	56.6%
K9	Dollar percent subcontracted	53.0%	47.3%
K10	Dollar percent awarded on multiyear basis	58.6%	33.0%

Table 6.7

Several observations can be made concerning subcontractor participation in multiyear contracting. When multiyear is used, it almost always results in the award of multiyear subcontracts. The percentage may vary, but on average upwards to 58% of all subcontracts are awarded using multiyear. The reason for this is not entirely clear but it is probably a natural fallout from the desire to maintain economies of scale and solidify savings to the prime contractor. After all, if the prime does not use a multiyear with his subcontractors, he risks foregoing savings in the form of economies of scale on his own contract. This is borne out by the greater use of different award criteria for subcontractor contracts when a prime is awarded a multiyear contract. Multiyear contracts take about the same amount of time to award as annual year

contracts but initially cost more to place. However, the overall costs are less to the prime due to greater subcontractor interest, increased competition, and economies of scale for subcontractor multiyear contracts. Of equal importance for continued savings is the degree multiyear encourages the development of new subcontractor sources of supply. These new sources help drive down costs to the prime and ultimately to the Government. In a majority of cases (at least in the short run) these new sources of supply are still doing business with the prime contractors helping to control costs.

C. CONTRACT CONDUCT

The central thrust of this section of the questionnaire was to assess the differential effects multiyear produces on a contract from that of annual year contracting. The specifics of what occurred on average amongst all the major system acquisition contracts comprising this study were examined. Findings are compared and contrasted with similar questions asked in previous studies where they are applicable. Differences will be highlighted and reconciled to the extent possible to determine the true impact of multiyear as separate from partisan beliefs.

The first question in this section concerns the retention of critical contractor personnel. One of the tenets espoused for multiyear contracting is that it allows the greater long-term retention of trained contractor personnel. These trained individuals in turn allow savings in production to occur from task familiarity and application of the learning curve on repetitive actions. A previous study examined this question from a subcontractor's perspective. It found 66% of companies surveyed agreed with the assertion that multiyear did allow the retention of trained personnel [Ref. 29:p. 70]. Along similar lines, another study found that 92% of contractors thought the existence of a multiyear contract would stabilize

their workforce [Ref. 32:p.70]. The results of the present study are presented in Table 6.8. It found that 43% of prime contractors agreed strongly that their multiyear contract resulted in greater retention of trained personnel. The remaining responses were either mild agreement or neutral with none disagreeing with the central contention. Government responses, on the other hand, were even more overwhelmingly positive with 79% expressing strong agreement.

C1. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT ALLOWED THE CONTRACTOR TO RETAIN CRITICAL AND HIGHLY TRAINED PERSONNEL?

Ind	DoD	Category
43%	79%	strongly agree
36%	21%	mildly agree
21%	0%	neutral/maybe
0%	0%	mildly disagree
0%	0%	strongly disagree

Table 6.8

This and previous study findings make it clear that multiyear contracting does have a positive impact on the greater retention of trained personnel than would have occurred under a similar annual year contract. This has implications for not only the preservation of a trained industrial base but for contract prices as well. The effect on the industrial base is clear: trained personnel produce a better product than untrained personnel. The impact on pricing is not so clear. Trained personnel can reduce scrap rates and create greater efficiencies which results in a lower overhead cost. Offsetting this is the fact that longer tenured personnel are usually more highly paid. The relationship between greater productivity and higher labor rates on contract pricing is not clear in the responses given in this or other studies.

Question C2 was concerned with the degree to which a multiyear contract might give a contractor a competitive edge over similar firms. The implication is that if a competitive edge is granted this may lock out future potential participants. The rationale for asking this question is rooted in the economic strength a multiyear contract can confer. Previous questions in this study have elicited written contractor comments volunteering information that a multiyear contract would achieve an economic foundation for their production facilities. Once this foundation is established, it is only a small step to use this leverage to create a dominant position within an industry. Previous studies have not approached this question from the position postulated here but they have asked whether multiyear would effect plant modernization or maintenance of technological currency. A query of subcontractors found by a bare majority (54.8%) thought multiyear would help increase their plant modernization [Ref. 32:p. 37] while a solid majority (77%) felt it would help maintain technological knowledge to some extent [Ref. 29:p. 71]. Both of these studies would tend to lead one to conclude that a competitive edge might be gained from a multiyear contract. Data presented in Table 6.9 of this study show a positive but ambivalent response. Most contractors (50%) agreed that multiyear would have some positive effect on competitiveness but just as many felt either neutral or disagreed with this conclusion. Government responses were just as non-committal with a significant portion feeling that multiyear did nothing to advance contractor technological competitiveness.

C2. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR ACHIEVED TECHNOLOGICAL ADVANCES FOR THE CONTRACTOR GRANTING HIM A COMPETITIVE ADVANTAGE?		
Ind	DoD	Category
29%	21%	strongly agree
21%	21%	mildly agree
29%	44%	neutral/maybe
21%	7%	mildly disagree
0%	7%	strongly disagree

Table 6.9

Reading this response and the others allows one to draw a narrow conclusion that competitive, technological advances are probably conferred by multiyear contracts but likely confined to only certain industries. Technological industries driven by Government requirements, such as aeronautics, may fall into this category. Other more market-driven sectors of the economy, such as the automotive industry, probably do not. Just as important to consider is the fact that multiyear contracts freeze technological advances at a certain state to allow production. Multiyear may grant an initial technological advance as well as a continuing economies of production but this does not necessarily translate into a competitive edge.

Section VII of the questionnaire evaluated risk and how it is translated into profit. Question C3 is related to this concept but focuses on how contractors see the opportunity for making a profit under multiyear vis-a-vis an annual year contract. While the first relates to what actually happened, the second is a subjective assessment of the possibility of what could have occurred. The results shown in Table 6.10 convey contractor ambivalence with responses spread almost equally across all possibilities.

C3. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT PROVIDED THE CONTRACTOR AN OPPORTUNITY FOR GREATER PROFIT?		
Ind	DoD	Category
30%	14%	strongly agree
21%	43%	mildly agree
21%	29%	neutral/maybe
21%	7%	mildly disagree
7%	7%	strongly disagree

Table 6.10

Up to 51% of the industry respondents conceded that multiyear provided a greater opportunity for making a greater profit than annual year contracts. The rest either disagreed or felt neutral about the possibilities. Government answers were similarly split. The conclusion drawn from this must be that while the opportunity may be present, profit is relative to the item being produced as well as other factors. The type of contract chosen, multiyear or annual, is but one of these factors and not always the most important. More will be said about profit in the next section on risk.

The burden of multiyear contracting on the contractor is the focus of question C4 which is again examined later in question C11. This burden was previously examined in question K4 regarding the prime's management of subcontractors. Here the emphasis is on the prime contractor's internal cost for contract administration interface with the Government. Question C4 asked to what degree contract administration costs were increased by using a multiyear vice an annual year contract. A previous study on subcontractors found that a majority believed multiyear would reduce their administrative costs [Ref. 32:p. 36]. Here the results presented in Table 6.11 show 72% of contractors disagreed to one degree or another that multiyear would increase their burden while 50% of Government responses expressed the same opinion.

C4. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT INCREASED CONTRACT ADMINISTRATION BURDEN ON THE CONTRACTOR?		
Ind	DoD	Category
7%	0%	strongly agree
7%	29%	mildly agree
14%	21%	neutral/maybe
36%	21%	mildly disagree
36%	29%	strongly disagree

Table 6.11

Another benefit multiyear should confer is the ability to better plan and coordinate long range work with the longer time spans available. Question C5 sought to assess whether multiyear increased the effectiveness of contractor long range planning for the contracts under consideration. The results presented in Table 6.12 show an overwhelming support for this contention by both contractor and Government respondents.

C5. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT INCREASED THE EFFECTIVENESS OF CONTRACTOR LONG RANGE PLANNING?		
Ind	DoD	Category
86%	79%	strongly agree
14%	21%	mildly agree
0%	0%	neutral/maybe
0%	0%	mildly disagree
0%	0%	strongly disagree

Table 6.12

Contractors strongly agreed 86% of the time with multiyear's ability to beneficially influence their long range planning. The rest of the responses agreed in the affirmative. There was not a single negative response received on this ability. Government responses were similar with 70% strongly agreeing. Of all the questions contained in

this portion of the questionnaire, this garnered the highest affirmative support. This support indicates an essential, defining characteristic of multiyear contracting that must be taken into consideration whenever it is proposed for use.

Question C6 was asked primarily to ascertain whether multiyear led to any greater degree of standardization of parts and manufacturing routines than might have occurred under an annual year contract. A large portion of the cost of manufacturing results from having to create and set up unique production stands and jigs. Manufacturing in either sequential or serial routines may be possible depending on the tasks and space available to the contractor. Multiyear's greater time should make it possible to consider using either existing manufacturing routines and tools or integrating items into current ones. Instead of creating new routines, longer planning times should allow greater flexibility. This in turn should promote greater standardization to cut costs and spread overhead expenses. A previous study found an affirmative response to this question from a general subcontractor point of view [Ref. 32:p. 34]. The results shown in Table 6.13 also support a majority opinion for this point of view.

C6. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT INCREASED CONTRACTOR STANDARDIZATION OF PARTS AND MANUFACTURING ROUTINES?		
Ind	DoD	Category
57%	64%	strongly agree
29%	29%	mildly agree
14%	7%	neutral/maybe
0%	0%	mildly disagree
0%	0%	strongly disagree

Table 6.13

For those contractors who have actually worked a multiyear contract, 57% strongly agree that it promotes standardization. Once again there were no negative responses

to this statement. This great support is most likely due to its intimate relationship with planning expressed in the previous question. Government responses were similar with a slightly higher percent (64%) agreeing with this statement.

The degree to which the defense industrial base can surge requirements during a national crisis has been an important factor linked to multiyear. This should come as no surprise since the primary reason for the recommendation from the Defense Science Board in 1980 for using multiyear was its ability to do just that [Ref. 30:p. xix]. A number of studies have focused questions on multiyear's ability to influence productive capability. Dovie, in his study of subcontractors and multiyear, asked whether multiyear could increase current production capacity but did not link this explicitly to surge requirements. Some 77% expressed a degree of agreement that it could increase output [Ref. 29:p. 74]. In another study of subcontractors, Madrid found that most believed multiyear could influence surge requirements but that it was largely dependent on the number of advance buys financed by the prime contractor [Ref. 32:p. 37].

Data from question C7 of the present study shown in Table 6.14 indicate a majority of prime contractors believe that multiyear can and does have a beneficial effect on the surging of needs during mobilization or a national crisis. Those holding strong opinions agreed 71% for contractors and 57% for Government respondents. The rest of the respondents were either positive or neutral (with one Government negative response). Left unanswered by this question is the degree to which this capacity may exist after the passage of time. This question read in conjunction with question F4, conveys the impression that quite apart from the time it would take to start up production, most of the production facilities needed still exist several years after the completion of most of these contracts. How long this will remain and what might be

needed to bring these facilities on line is a question worthy of further inquiry.

C7. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT INCREASED THE CAPACITY TO SURGE PRODUCTION DURING A NATIONAL CRISIS?		
Ind	DoD	Category
72%	58%	strongly agree
14%	21%	mildly agree
14%	14%	neutral/maybe
0%	7%	mildly disagree
0%	0%	strongly disagree

Table 6.14

The effect multiyear contracting has had on increased contractor productivity was the aim of question C8. The principal source of this efficiency should come in the form of greater labor task familiarity and economic lot purchases. When subcontractors were queried on multiyear's effect, 80.6% stated that it had a positive impact on their productivity [Ref. 32:p.35]. A majority of current survey respondents felt the same. Some 64% of contractors and 50% of Government respondents strongly believed their program had achieved greater contractor productivity than would have a similar annual year contract. Results are presented in Table 6.15.

C8. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT INCREASED CONTRACTOR PRODUCTIVITY?		
Ind	DoD	Category
64%	50%	strongly agree
29%	43%	mildly agree
7%	0%	neutral/maybe
0%	7%	mildly disagree
0%	0%	strongly disagree

Table 6.15

The question of subcontractor quality under a multiyear contract was asked in question K6 of the last section. There, prime contractors indicated that the level of subcontractor quality was about the same as a comparable annual year contract. Question C9 sought to explore this question from the perspective of the complete contract even though subcontractors made up on average 53% of the dollar value of the prime contract. The largest single response was neutral, but a bare majority of contractors (at 58%) did feel quality was somewhat better than an annual contract. Evaluating both of these questions together, prime contractors felt that quality on both subcontractor work and overall work was as often as not about the same as an annual year contract. Table 6.16 presents the responses for this question.

C9. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT INCREASED OR ENHANCED THE QUALITY OF THE FINAL PRODUCT?		
Ind	DoD	Category
29%	58%	strongly agree
29%	21%	mildly agree
42%	14%	neutral/maybe
0%	7%	mildly disagree
0%	0%	strongly disagree

Table 6.16

Speculation on why this is so may be related to the selection of quality contractors mentioned in K6. Contractors may have selected the best subcontractors available, consequently, total contract quality would not increase despite whatever efforts they put into it. Total Government responses were more positive with 79% agreeing that quality was better. The Government response is somewhat puzzling in light of the previous question on subcontractor quality which reflected an ambiguous response. This could be a reflection of the degree of contractual control exerted by the Government

or a prejudice that views the prime as better than the sum of its subcontracted parts. It may be that quality and multiyear have no effect on one another except through the operation of other variables not detected in any of the questions used in this survey.

Related to prior questions C8 on productivity and C5 on planning is C10 on cost avoidance and cost savings. These two areas are the principal factors involved in achieving a high rate of productivity and efficiency. With multiyear's greater allowance of time, planning can be used to maximize both. The interrelatedness of these questions should assure a similar response on the current question. Indeed, total contractor responses listed in Table 6.17 was 93% positive, with 72% feeling strongly and 21% mildly that they benefitted from multiyear in these areas. Only one negative contractor response was received. Government responses followed the same pattern with 86% indicating some measure of agreement. Among all contractor responses in the section, this was the second highest showing of strong agreement behind that of planning.

C10. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT ACHIEVED SIGNIFICANT COST AVOIDANCE AND OR COST SAVINGS FOR THE CONTRACTOR?		
Ind	DoD	Category
72%	50%	strongly agree
21%	36%	mildly agree
0%	7%	neutral/maybe
7%	7%	mildly disagree
0%	0%	strongly disagree

Table 6.17

The extent to which a multiyear contract may increase overhead burden on management is the focus of question C11. This question is distinguished from an earlier question (C4) on the extent of contract administration required by multiyear by its emphasis on the expenditure of managerial resources.

The earlier question found little if any relationship between multiyear and day to day contract oversight. Since both are related to the expenditure of oversight resources the responses should be the same. Contractor responses shown in Table 6.18 do follow a similar pattern. When asked if multiyear increased management and overhead burden, 72% disagreed either mildly or strongly with the Government response being similar. As predicted, multiyear contracting is clearly no greater burden than an annual year contract regarding oversight, administration, and management time. In fact, just the exact opposite can be argued since multiyear saves management time and administrative overhead costs to the contractor. In the quest to reduce contractor overhead, multiyear may offer one solution.

C11. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT RESULTED IN A GREATER EXPENDITURE OF CONTRACTOR MANAGEMENT TIME AND OVERHEAD?		
Ind	DoD	Category
0%	0%	strongly agree
7%	14%	mildly agree
21%	14%	neutral/maybe
36%	36%	mildly disagree
36%	36%	strongly disagree

Table 6.18

Question C12 is a variation on C5 and involves the degree to which multiyear interferes with production routines and work packages. Since this question is also systemically tied to planning, agreement with this question should be high. In actual fact, while a majority (58%) expressed agreement in one form or another, the degree of affirmative responses was much less than might have been expected given the response in question C5. Government responses were also mixed and showed no clear cut consensus. This response pattern may reside in

the nature of the major system contracts. Nearly all of them are follow-on contracts to at least one annual year contract. Work packages and production routines were probably developed then frozen and carried over into the current contracts. What is really being reported is the lack of any clear cut differences in the manufacturing routines. This seemingly contradicts question C5 and its overwhelming response that multiyear allows greater planning. An explanation that makes sense of both may be that while most work packages and routines are set from the previous annual year contract, much remains regarding planning decisions for selection of subcontractor sources, lot purchases and production deliveries. The results of this survey question are presented in Table 6.19.

C12. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT ALTERED PRODUCTION ROUTINES AND PRIORITIES AS WELL AS WORK PACKAGES?		
Ind	DoD	Category
29%	12%	strongly agree
29%	21%	mildly agree
21%	32%	neutral/maybe
0%	14%	mildly disagree
21%	21%	strongly disagree

Table 6.19

Financing for a multiyear contract is critically important to the contractor. The length of performance coupled with large up front expenditures exposes the contractor to burdensome interest charges without a commensurate inflow of cash to offset them. Depending on when delivery is to occur, it is possible a contractor might not see any money for work completed until several years worth of effort is accomplished. FAR recognizes the importance of this factor by instructing contracting officers to give special consideration to contractor cash flow requirements. Question

C13 sought to assess the degree to which special financial arrangements were used on multiyear contracting. Table 6.20 contains results that predictably show an increase in different financial methods used from what would normally be encountered for an annual year contract. The degree of difference is less than one might have thought given that only half of the contractor respondents agreed with the problem statement. The large number of neutral and disagreement responses might indicate carry over financial methods used in the annual year contract. Government responses were more inclined to see an actual difference in financing occurring.

C13. COMPARED TO A SIMILAR ANNUAL YEAR CONTRACT, THIS MULTIYEAR CONTRACT ALTERED CONTRACT FINANCING FOR THE CONTRACTOR?		
Ind	DoD	Category
7%	7%	strongly agree
21%	57%	mildly agree
14%	7%	neutral/maybe
37%	0%	mildly disagree
21%	29%	strongly disagree

Table 6.20

This survey as well as the research literature are replete with references to multiyear's ability to generate savings. The majority of these savings come from economic factors but the percentage of this split is not always clear. Question C14 sought to determine where savings on a multiyear contract come from. Table 6.21 displays some revealing figures. On average, most contractors believe the ability to obtain better vendor prices due to large lot purchases is the primary cause in achieving multiyear savings. The percentage of total savings attributable to this factor was 52.9%. Responses to this factor ranged from a low of 30% to a high of 100%. The next most notable condition producing savings was manufacturing economies from increased efficiency and learning

curves from larger lot volumes. On average, 31.2% of multiyear savings were acknowledged as coming from this condition while individual responses ranged from a low of 0% to a high of 50%. Despite problems mentioned with inflation savings detailed in Chapter II, many contractors still attributed at least 11.7% of savings to this factor. The total of other factors such as administrative savings and the like came to only 4.2%. Different figures may have been generated if a wider range of factors were included but clearly multiyear's major contribution is economic with all else being subsidiary. Government percentages had a tendency to place less emphasis on obtaining better vendor prices and more on inflation and other factors.

C14. IF SAVINGS WERE ACHIEVED ON THIS MULTIYEAR CONTRACT WHAT WAS THE SOURCE OF THE SAVINGS?		
Ind	DoD	Category
11.7%	16.2%	inflation/cost growth avoidance
52.9%	39.2%	better vendor prices
31.2%	34.6%	manufacturing economies
4.2%	10.0%	other

Table 6.21

The last question concerned the length of the multiyear contracts under question. The reason for including question C15 in the survey was to verify that the contracts were indeed of multiple years. The average contractor reported contract length was six years whereas the Government response was five years. Quite a number of responses exceeded FAR's statutory limit of five years. An explanation of how these contracts could exceed this limit is more than likely the result of a loose definition of multiyear. As noted before most, if not all, of these programs involved follow-on contracts to annual year procurement. Both the Government and contractors were obviously including these additional years in this final

question. To what degree this may have tainted other answers is not known.

D. RISK

Contractor risk assumption varies directly according to contract length. As time increases, decisions in the latter years are based less on fact and more on judgment which can become increasingly susceptible to error. Multiyear contracts control this increased risk by use of a cancellation clause. The type of contract chosen is also an important element in risk assignment as it is in annual year contracts. These two elements taken together define the risk environment for multiyear contracts.

FAR allows only fixed-price contracts to be used in conjunction with multiyear requirements. This reflects an assessment of design and requirements stability and the dampening effect on risk they have. Question R1 reflects the range of fixed-price contracts used by the respondents of this survey. Perhaps not too unexpectedly, the majority of programs chose to use a firm-fixed-price instrument in 72% of the acquisitions as shown in Table 6.22. This is the contract type most often discussed or assumed to exist in most research literature. Whether this type was consciously chosen or just assumed to be the best type for a major system program is unknown but worthy of additional investigation. The next most used contract type was a firm-fixed-price with an EPA factor. This contract type is used when economic conditions are uncertain. Surprisingly, because of the support given to it by both the FAR and 10 USC 2306, greater use than shown was expected. The last contract type used, FPIF, was cited by one program. Theoretically, if multiyear risks were as large as it is often purported to be, greater use should be made of this contract type. Its absence may reflect difficulty in how target and ceiling costs as well as an adequate share line are to be determined for a multiyear contract.

R1. WHAT CONTRACT TYPE WAS USED?			
Firm-Fixed-Price	Fixed-Price w/EPA	Fixed-Price w/Incentive	Category
72%	21%	7%	Percent
10	3	1	Number

Table 6.22

Equally important as the type of contract chosen is the degree to which the cancellation ceiling provides protection against risk to the contractor. An incorrectly calculated ceiling may expose the contractor to unacceptable risk or curtail efforts to promote economic efficiencies. Question R2 sought to assess the degree of success in covering this risk. As the data in Table 6.23 show, the degree of risk as seen by both the Government and contractors was deemed adequately covered. Approximately 50% of contractor and Government respondents deemed the coverage was just right. Disturbingly, the remainder said risk was either slightly higher or much greater than expected. The implication is that opportunities for economic efficiency are being squandered in an artificial attempt to keep the cancellation threshold low. In light of the fact that cancellation ceilings are rarely invoked, this means contractors are being motivated not to achieve the maximum cost savings possible on some multiyear contracts.

R2. DID THE TERMINATION LIABILITY/CANCELLATION CEILING ACCURATELY REFLECT CONTRACTOR RISK?		
Ind	DoD	Category
0%	0%	yes, greater than expected
0%	7%	yes, but only a little more
50%	44%	yes, accurately reflected
14%	21%	no, risk was slightly higher
36%	21%	no, risk was much greater
0%	7%	unknown

Table 6.23

The reward for contractor risk has always been viewed as an adequate profit return. Question R3 attempted to assess whether the profit generated under a multiyear contract is equal to that of a similar number of annual year contracts. The rationale for asking this question was to assess whether contractors were being adequately compensated for the increased risk they undertake often ascribed to multiyear. If multiyear is indeed as risky as is commonly thought, one would expect profit levels to be greater to compensate for this risk. Alternately, if risk is not as great, profit should be the same or less than a similar number of annual year contracts. The results are presented in Table 6.24. A majority of Government respondents (64%) indicated that contractor profit was the same as an annual year contract with a smaller group (29%) conceding that it was slightly below what could have been made. Contractors felt differently. About a third thought profits were slightly higher than what could have been anticipated on an annual year contract, a third thought it was about the same and a third tended to see it was much lower than could have been realized. Grouped, the Government and contractor respondents saw profit as being either the same or above what an annual year contract could have returned about two-thirds of the time with it falling short of expectations about 33% of the time. When profits were lower than expected contractors had a tendency to conclude that they were much lower than an annual year would have been. An interpretation of these data might tend to support a conclusion that risk is not as great as expected since profit would be the same as an annual year contract. An alternative conclusion could be that profit guidelines are not being applied adequately if profit is equal on both multiyear and annual year contracts.

R3. WAS THE NEGOTIATED PROFIT GREATER THAN A SIMILAR NUMBER OF ANNUAL YEAR CONTRACTS WOULD HAVE BEEN?		
Ind	DoD	Category
0%	0%	yes, greater than expected
36%	0%	yes, but only a little more
36%	64%	no, it was right on target
7%	29%	no, it was slightly lower
21%	0%	no, it was much lower
0%	7%	unknown

Table 6.24

With anticipated conclusions as diametrically opposed as those reached in question R3, question R4 was included to provide clarification on the profit and risk relationship. Question R4 asks if the weighted guidelines, the basic method of determining profit in single source negotiated contracts, reflected the risk undertaken by the contractor. In simpler terms it asks if profit received equaled risk undertaken. The responses in Table 6.25 show a marked contrast. A majority (72%) of contractors felt that the weighted guidelines did not do an adequate job of capturing risk. A large portion (37%) of Government respondents also agreed with this point. Taking all of the "yes" answers together, approximately a third of the contractors felt the weighted guidelines were adequate while approximately half of Government responses agreed. A contractor interpretation of questions R3 and R4 taken together might be that while the profit negotiated reflected the amount generally expected on an annual year contract, the weighted guidelines did not reflect the risk undertaken for the multiyear contract. An interpretation of Government responses for both questions might be that profit is commensurate with risk which on average was about the same as that of an annual year contract.

R4. DID THE DD FORM 1547 (WEIGHTED GUIDELINES) ADEQUATELY REFLECT CONTRACTOR RISK FOR MULTIYEAR?		
Ind	DoD	Category
7%	21%	yes, much greater
21%	21%	yes, but only slightly
72%	37%	no, about like an annual contract
0%	0%	no, much less
0%	21%	unknown/not applicable

Table 6.25

Only a few elaboration comments were received. Most comments were critical of the weighted guidelines. One respondent noted that risk considerations were entirely different in a long-term contract than could be captured by the weighted guidelines. Others noted that the length of the contract, cash flow considerations and the ability to predict inflation all played havoc in the use and projection of factors. One contractor noted that his figures and those of the Government using the same weighted guidelines criteria of a multiyear contract were much different. Clearly, most contractors were not satisfied with the weighted guidelines profit determination and believed additional guidance was called for to handle multiyear's unique combination of length and risk.

The problem of profit erosion over time noted by one contractor was the basis for question R5. Unless a contract forecasts inflation as well as the underlying interest rates, the generous profit negotiated at the beginning of a five year contract may be negligible at its end. This reduces incentive to undertake a multiyear contract. The results of question R5 are presented in Table 6.26. As could be predicted from the previous responses, a majority (58%) of Government respondents thought risk to profit was addressed by the terms of the contract. Contractors, on the other hand, were evenly split

amongst those who volunteered a response. Taking all contractor "yes" and "no" responses together, 43% both agreed and disagreed with the position posed in the question. Whether this represents a real problem or just the historical difference in profit perception held by each party is unknown. What is certain is that the perception that a problem exists by nearly half of industry must act as a disincentive to accept a multiyear contract.

R5. WAS PROFIT RISK CAUSED BY AN ESCALATION IN INTEREST RATES ADEQUATELY ADDRESSED BY THE TERMS OF THE CONTRACT?		
Ind	DoD	Category
29%	51%	yes
14%	7%	yes, but not completely
29%	14%	no, but some protection provided
14%	14%	no
14%	14%	unknown/not applicable

Table 6.26

The next question (R6) addressed the negotiation strategies used in reaching an agreement. Intuitively, the point might be obvious that the strategies used in negotiating an annual and multiyear contract should be different. But what is theoretically plain is not always particularly obvious. The rationale for asking this question was to find out if both parties perceived the need to use different negotiation strategies. The motivation to use a different strategy might be based on risk assessment. If a contractor perceived risk as high, he might want to negotiate an FPIF contract that returned the greatest degree of sharing for any savings. Additionally, comprehensive and concrete EPA clauses with a generous cancellation ceiling might also be negotiation objectives [Ref. 13:p. 34]. The majority of both the Government and industry respondents did indeed perceive the uniqueness of using a different strategy from that of an

annual year contract. Taking all the affirmative responses, 71% of industry said the strategy used was different while 58% of Government felt the same. The percentages that thought the strategies were the same equaled 29% in both cases. These data are shown in Table 6.27.

R6. WAS THE NEGOTIATION STRATEGY USED FOR THIS MULTIYEAR CONTRACT DIFFERENT FROM AN ANNUAL YEAR NEGOTIATION?		
Ind	DoD	Category
42%	29%	yes, much different
29%	29%	yes, but only slightly different
29%	29%	no, about the same
0%	0%	no, much easier
0%	13%	unknown/not applicable

Table 6.27

Contractor provided elaborations for question R6 were few and mixed in content. One respondent noted that the risk involved in his negotiation was considerable while another stated that because of the length of the contract and the chance to correct mistakes later, he felt a greater willingness to take a risk. One other contractor noted that he gave away too many price concessions because he wanted the multiyear contract to stabilize his business. Overall, the strategies used by contractors could not specifically be linked to a risk abatement strategy. Government responses predominately mentioned the need to better understand costs. One respondent stated that a long range estimate of the contractor's business had to be developed to assess the impact of this contract. Others noted the availability of data from previous annual contracts that provided more insight on contractor costs. No link was found to risk other than an implication that the negotiation had to be done right since the next chance to correct any errors was several years into the future.

Finally, the last question in this section deals with the relationship between contract length and program risk. The longer a program takes to complete the greater the chance of a miscalculation in some variable that was made at the beginning of the contract. Intuitively, contractor responses should indicate that risk increases as time lengthens. The results for question R7 in Table 6.28 show this to be true. Fifty-eight percent of all contractor responses disagreed with the negative statement concerning risk having no relationship with contract length. The Government saw the relationship in just the opposite terms with a clear majority believing that the length of the contract was not related to program risk.

R7. THE LENGTH OF THIS MULTIYEAR CONTRACT WAS NOT RELATED IN ANY WAY TO PROGRAM RISK?		
Ind	DoD	Category
7%	7%	strongly agree
21%	57%	mildly agree
14%	7%	neutral/maybe
37%	0%	mildly disagree
21%	29%	strongly disagree

Table 6.28

The data from the forgoing questions on risk show some interesting contradictions and differences between the Government and industry. Typically the most risky contract type was used, a firm-fixed-price contract, for multiyear. The cancellation ceiling was generally adequate to cover risk in most cases but when it was not, it failed badly. Contractors thought profit compared to an annual year contract was either the same or slightly above, with the Government believing it was the same. If profit is a reward for risk and multiyear contracts are more risky, then profit is too low. Contractors were not happy with the weighted guidelines and how they are applied to multiyear. Problems in this area are

recognized by the Government but much less so than contractors believe. Both were split on their feelings as to whether risk caused by inflation and rising interest rates is being handled adequately. This may depend on when a contract was awarded and executed. Both recognize the need for different negotiation strategies in multiyear contracting but neither achieved an adequate portrayal of risk in their negotiation strategies. When evaluating risk in relationship to contract length, the respondents were split. Contractors feel they are shouldering a major portion of risk over the life of the contract.

E. CHAPTER SUMMARY

The Chapter examined subcontractor participation in multiyear contracting from the prime contractor's perspective, the conduct of multiyear contracts and how risk was translated into the specifics of a contract. Multiyear has shown an ability to encourage the development of new subcontractor sources of supply but generally does not improve quality. Multiyear is no more burdensome than any other contracting method and confers the great advantage of forcing long-range planning and evaluation. Risk is still high in multiyear contracts from a contractor's viewpoint with the weighted guidelines method of profit estimation not considered wholly adequate. The next Chapter will focus on the written comments on general aspects of multiyear contracting received from contractor and Government respondents.

VII. ANALYSIS OF WRITTEN COMMENTS

A. INTRODUCTION

This section consists of five short answer questions. The purpose for including these questions was to allow respondents an opportunity to express any comments on key issues raised by the survey if space were not provided elsewhere to do so. Additionally, general questions were asked about multiyear contracting to obtain an indication of a respondents's broader feelings toward multiyear. All but the last question are essentially distillations of key ideas covered in part throughout the questionnaire.

B. RESPONDENTS' COMMENTS

Question W1 asked respondents to identify the single most urgent item in need of change that would encourage the greater use of multiyear contracting. Contractor responses to this question touched on a number of things. The most frequently mentioned was the need for a real defense budget longer than one year in length. Many noted that annual appropriations tended to keep the focus too short-term to conceive and produce modern weapons. A three- to five-year budget cycle would meld flawlessly with multiyear. Another popular suggestion was the streamlining of the approval process as well as concurrent commitment of funding once approval is given. One contractor noted that it is nonsensical after approval is given to use multiyear to have additional Congressional reviews of a program on top of annual budget reviews. Either process can result in the termination of a project unexpectedly. The approval and the budget process should be tied together. Other frequently mentioned items were the need for requirements stability linked to a clear vision of national military strategy. Items mentioned by only one respondent were such things as the need for realistic EPAs without excessive delays in adjustments, cancellation ceilings

that cover all of a contractor's plant and equipment investments, and the uncoupling of cancellation ceilings from advance material purchases.

If one word could describe the Government response to question W1 it would be this: stability. But most respondents were more expressive in their definition of what stability comprises. Most were concerned with the current environment where programs and commitments are still ill-defined. Until this is clarified, some projected a declining use of multiyear. The feeling that decisions thoughtfully arrived at were either ignored or disregarded by a Congress intent on second guessing was a constant theme in nearly all the responses. One respondent stated that Congress should allow DoD to run its multiyear programs like a business. Many expressed frustration at what was termed Congressional micro-management. Others mentioned the problem of how business is conducted. A program manager put it succinctly that there was a need for a "horizon of cost benefit greater than one year." Along similar lines, another suggested that to encourage multiyear defense budgets comprising three- to five-year time frames should be enacted. Tellingly, not a single respondent mentioned any procurement or acquisition barriers in need of changing.

The focus of questions W2 and W3 were upon contractor business practices. W2 asked what change in commercial business practices multiyear influenced, whereas question W3 asked the principal benefits multiyear contracting bestowed on contractors. Interestingly enough, most contractors said that multiyear had no effect whatsoever on their commercial business practices. Those that did explain their position stated that their commercial practices were governed by the dictates of the market. Multiyear contracting for major systems was a Government creation that mixed many artificial variables with some market mechanisms. One contractor did note that multiyear helped him to combine or "package" some of

his DoD and commercial business to subcontractors achieving greater volume and interest as well as lower prices.

Contractor answers to question W3 on what benefits they derived from multiyear contracting all emphasized its classic economic argument for multiyear: stable requirements result in longer term commitments which equate to lower prices. All other responses clustered around this one principle. Learning curve, greater efficient use of productive equipment, and the avoidance of multiple set-up charges were mentioned by at least one or more respondents. Long-term planning was also stated or implied by most contractors as one of the chief benefits of multiyear contracting.

As might be expected, Government responses to questions W2 and W3 were short and approximately the same. Most thought the biggest influence on commercial practices was the ability to take advantage of price breaks from larger purchases as well as the establishment of long term relationships. Along similar lines, the greatest benefit for contractors was their ability to plan in a stable environment.

Question W4 asked respondents to speculate about the causes for the reduction in multiyear contracting since the 1980's. Contractors focused on many items. The most popular explanation was a reduction or lack of stability in requirements. Some speculated that Congress and politics were to blame. One contractor noted that Congress spent funds on politically popular programs ignoring the fundamentals. Still another blamed the lack of proper documentation for multiyear's savings which created a lack of interest in using the concept. Numerous respondents noted the clear absence of any defining vision that would sustain spending over several years.

As one might expect many of the Government responses to question W4 focused on the changing defense environment. Mentioned most often were unstable and declining defense budgets. Some mentioned other facets complicating the core

problem. One thought the Competition in Contracting Act (CICA) with its seeming emphasis on competition for competition's sake was part of the problem. Still another recognized DoD's role in exacerbating the process by continually striving for design changes in the elusive pursuit of the perfect product. Commenting on the lamentable decline in the use of multiyear contracting for major systems, one program manager noted: "It doesn't make sense and it should not be!!!"

Question W5 was not so much a question as a place for final comments. Many that were mere elaborations have already been incorporated into the questions to which they pertain. Still, some comments of note were made. One respondent stated that the termination aspects of multiyear were too complex and in need of revision. This is especially true now that funding may become even more uncertain. Several contractors noted that without multiyear contracts, it would become increasingly difficult to retain loyal, motivated employees possessing crucial skills. Echoing this sentiment, the last word in this survey is given to a representative of a major military manufacturer on multiyear's real value:

> Multiyear contracting encourages capital investment far beyond what annual contracting does. Capital investment is the single greatest influence on productivity. All U.S. industries are working to increase their competitiveness in world markets as free trade expands. Higher productivity in Defense is critically important. Yet the real emphasis is absent as evidenced by the reduced use of multiyear contracting over the past few years.

C. CHAPTER SUMMARY

This Chapter has focused on written contractor and Government comments to general questions about multiyear contracting. Both see the principal benefit of multiyear as economic and ascribe its declining use to environmental conditions linked to budget instability.

VIII. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

There were no startling revelations amongst the data and comments collected from either contractors or Government program offices in this study. To one degree or another the positions and opinions expressed by the participants in this study were anticipated in either the research literature or by intuitive understanding. Differences did occur between the two groups. Several issues stand apart as notable or of greater significance either because they were expressed more strongly than expected or were contrary to accepted conventional wisdom. These issues will be highlighted through an examination of the research questions which prompted this study, conclusions drawn from the research data, recommendations, and further areas of inquiry needed.

B. CONCLUSIONS

This section will answer the primary and four subsidiary research questions that motivated this study and are listed in Chapter I. The primary research question:

What is the contractor perspective on how DoD has used multiyear contracting for the acquisition of major systems?

The impact of the contractor perspective can best be summarized by listing those key points that came through clearly from the results of this survey. In no particular order these are as follows:

1) Multiyear is the best method to achieve savings for both the contractor and the Government. It is truly a "win-win" situation for both.
2) So far, risk has not always been adequately addressed; profits are not commensurate with risk shouldered by the contractor.

3) Political influence in program selection is too great and often disruptive although it can at times provide help to some programs.
4) There is too little use of multiyear contracting due to budget problems.
5) Contractors would like to have a greater voice in the selection and nomination process of multiyear candidates.
6) Congress has unnecessarily complicated the process by either conducting or ordering too many reviews and not abiding by past recommendations and decisions.
7) Cancellation ceilings are not always adequate and procedures govern them need to be reexamined.
8) Instability occurs in every program but is not a significant problem.
9) Multiyear helps to create and foster new sources of supply and competition.

The contractor perspective is by no means incompatible in many areas with that of the Government. Many of these opinions were actively voiced by a number of Government program offices. What is important about this perspective is its consistency and positive tone which can be used as a bridge during negotiations.

1. What are the advantages and disadvantages of multiyear contracting?

The primary and only real advantage to multiyear contracting is its economic efficiency it generates in the form of EOQ purchases. All the other advantages mentioned in Chapter II such as manufacturing stability, preservation of the defense industrial base, stimulation of new sources of supply at the subcontractor level, stabilized work force, and enhanced planning are but byproducts of this single process. All of these advantages stem from the same cluster of economic

efficiency made possible by linking the contracting process to an extended period of time.

The disadvantages of multiyear contracting are caused by two factors: inherent and environmental. The inherent factors are linked to time and cannot be separated or ameliorated without active intervention. These factors are such things as possible increased storage costs, decreased competition at the prime contractor level, and greater risk. Environmental factors are imposed on multiyear from the outside and have nothing to do with the method per se. The two most notable factors are decreased Congressional reluctance to authorize multiyear due to concerns on budget flexibility and the amount and degree of any possible cancellation liability.

2. How do contractors and the Government respond to differences between annual year and multiyear contracting?

Differences in how contractors and the Government respond to multiyear tend to be more of degrees of difference rather than of kind. Contractors and the Government agree in seven areas affected by multiyear or share such minor differences that their positions are essentially the same. These seven areas are: technological advances, contract burden, planning, standardization, use of managerial time, establishment of work packages, and contract financing. There are also six areas in which one or the other agree or disagree more strongly. The first of these is the retention of critical personnel. The Government tends to agree more strongly than contractors do that multiyear prompts the retention of crucial personnel. The second is profit. The Government believes multiyear allows a greater opportunity for profit than might be expected under an annual year contract. The third is surge capacity where contractors believe more strongly than the Government that multiyear provides an advantage in producing items during a national crisis. The fourth is productivity. Contractors

believe more strongly in multiyear's productivity incentive than does the Government. The fifth is cost avoidance. Contractors believe more strongly that multiyear grants benefits in cost avoidances than the Government does. The sixth and final area is quality where the Government believes more strongly than contractors that multiyear produces a superior product. These differences are slight and once again a matter of degree. There is only one topic that provokes a disagreement and that is risk. Contractors see multiyear's risk as much higher than does the Government. The Government believes that safeguards, such as the cancellation ceiling, provide a large element of protection from risk.

The difference in risk perception branches out into other areas. Contractors feel that profits under a multiyear have been about the same as an annual year contract. If risk is greater under multiyear then profit too should be much greater. This dissatisfaction is most keenly evident in a general dislike of the weighted guidelines as not adequately representing their risk. A higher risk perception affects other discretionary spending such as investment decisions. Questions in this survey indicate multiyear has stimulated investment at a rate greater than an annual year contract, but the key point is whether the potential could have been created for a better rate. Written comments provided by contractors suggest it could have been if risk were perceived as being lower. Greater investment in productivity improvements would have caused greater savings than were actually achieved. By lowering risk the payoff might have been even greater savings.

3. What do contractors perceive as desirable characteristics of a multiyear contract?

This question must be answered from both a theoretical and practical point of view. The theoretical ideal multiyear contract would be one that reduces risk to a minimum while allowing an adequate return profit. One of the greatest

concerns of contractors about multiyear is their exposure to unforeseen variables over an extended period. Risk can be reduced to an adequate level by including EPAs, generous cancellation ceilings and a greater profit to cover the unknown. From a practical aspect, the characteristics most desirable in a multiyear contract are those qualities inherent in it. In fact, it would not be too far wrong to conclude that these attributes are so attractive that contractors might prefer multiyear to almost any annual year contract. The first of these features is stability. Stability allows the development of a subcontractor base, trained personnel, and an economic foundation for a business. Second, is the cluster of economic benefits which come from a longer range perspective. Economic order quantity buys, long range planning and application of the learning curve are a few that are the most obvious. The third are those factors that help to sustain a business. These are the retention of a competitive edge, creation of a technological advantage, and expertise in a field. The fourth is a sense of accomplishment in doing the right thing. Throughout the contractor responses received in this survey, there was an undercurrent of devotion or patriotism. Contractors <u>want</u> to do the right thing, want to feel a sense of pride in their accomplishments and felt frustration that multiyear, which benefitted both parties, was not being used as they thought it should or to the degree it could be.

4. What application does multiyear contracting have in current acquisition reform efforts?

This question could not be answered directly from this research but requires speculation based on a number of findings. The time of billion dollar major system program acquisitions is probably past. The future of multiyear contracting will probably reside in a return to its original roots. In the late 1950's and early 1960's before multiyear

was elevated to major system acquisition use, its goal was to avoid problems with annual year budgets. Despite many tentative efforts, Congress has yet to do anything about enacting a true budget process different from annual year budgeting. The rationale for using multiyear is still just as valid today as it was when first proposed.

The problem with multiyear is not one of effect but of perception. Multiyear's association with major systems has for all intents tarnished its image. Contracting officers at levels lower than major system acquisitions have heard of its problems and become adverse to using it. Despite some grumbling about risk and profit, contractors on the other hand have always been predisposed positively towards multiyear. The challenge is in reducing the perceived risk in the eyes of contracting officers and making it "safe" for them to experiment and grow comfortable with the process. The central funding of cancellation ceilings or the creation of some type of insurance program against cancellation would do much to alleviate these fears. Multiyear need not be for the maximum of five years. Contracts could be for two or three years and provide for options. The objective is to set the conditions or structure it in such a way that contracting officers will want to use the process when problems with budget instability exist. With its emphasis on producing tangible savings through economies of scale where none might have existed if using annual year contracting, multiyear contracting is very relevant to today's cost cutting environment. It needs a push or dramatic gesture from higher levels in DoD to bring it back to center stage.

C. RECOMMENDATIONS

Although the focus of this study was to obtain the contractor perspective of major system acquisitions, recommendations are directed entirely to the Government. The source of contractor problems resides in the execution of

well-intentioned but flawed Government policies at or near the genesis of a major system. The modification of these policies would rectify many of these systemic problems. Recommendations are made in no particular order and may, at some level of effort, contradict each other. They are applicable to not only major systems but all multiyear contracting as well.

1. Modify Stability Requirements

As noted numerous times in this study, stability in design, funding and quantities is a prime requirement for the consideration of any program for multiyear contracting. Yet this study also shows that it is inevitable that many successful programs will still persist in showing, albeit small, a degree of instability. With the average length of a major system acquisition in excess of five year's duration, this is a given. Congress has regularly approved projects that GAO found to be unstable rendering this evaluation meaningless. Of 20 programs approved from 1989 to 1991, GAO found instability in all but four of them. Stability should not be abandoned entirely but only enforced where responsibility can be assigned. Of the three stability indicators, two of them, requirements and funding, are essentially at Congressional discretion. Selection for design stability is the only measure which can be influenced by DoD.

Major system acquisition programs nominated to Congress already have the backing of the Services. Requirements and budget stability reviews are redundant as noted by one contractor in this study. Programs should be evaluated for design stability only. If the probability is great that design instability will occur, the program should not be approved. In return for Congress guaranteeing requirements and budget stability, responsibility for design stability should be placed squarely on the Services and enforced. Approved programs should be reviewed yearly by Congress. If

design instability is present, these contracts should be terminated with needs reverting to annual year buys. In this manner, the Services may become self-regulating for major system programs nominated to Congress and allowed the leeway to make management decisions which have consequences.

2. Central Funding of Cancellation Ceilings

Multiyear contracting is perhaps the greatest single method of generating savings of any contracting method. The concept should be encouraged by making the decision to use multiyear as appealing as possible. While the cancellation ceiling was not deemed to be a disincentive for contractor investment decisions, about half of all contractors still felt they carried greater risk than was provided for by the cancellation coverage. This in itself sends a message to contractors that risky decisions are to be avoided. The same message is conveyed to contracting officers but in a different manner. The chance of any program having to exercise its cancellation ceiling is small. One study over a 20-year period estimated it at 14% [Ref. 11:p. III-20]. If a program is canceled, the funding to do so must be obtained from somewhere. This leads to either a hoarding of program funds or a conservative approach that forgoes the use of multiyear. This engenders a conservative, risk averse stance that seeks to avoid trouble instead of exploiting an opportunity. While this may be a laudable trait in an accountant, it certainly is not the kind of attitude promoted for contracting officers nor program managers. Thus both parties, the contractor and the Government, are subliminally reinforced in making conservative decisions.

A central cancellation ceiling pool would do away with much of this. For one, it would remove contractor fears about the cancellation ceiling. Ceilings could be made as generous as necessary to encourage behavior that will lower costs. Program managers and contracting officers may also be

motivated knowing that if a mistake were made money would not come out of their program. More broadly, this would also encourage other levels of Government who may be more risk averse to use multiyear. Failure to do so may result in foregoing potentially vast cost savings from fear and inertia.

3. Greater Profit for Multiyear Contracts

The weighted guidelines attempt to motivate contractors to invest in facilities by allowing a measure of their investment to be reflected in higher contract profits. A similar policy might be used to reward the use of multiyear contracting. Current profit guidance on multiyear contracting is underdeveloped. The type of contract, either fixed-price or cost-reimbursement, determines the profit rate recommended for multiyear. Low estimates show multiyear typically saving six to ten percent on a contract. A portion of this percentage should be reflected in higher recommended profit rates to expand the use of multiyear. A higher profit rate could also compensate for other factors such as a smaller cancellation ceiling.

4. Contractor Input on Multiyear Candidate Selection

DoD has been slow to recognize and correct its deficiencies in market research [Ref. 50:p. 94]. Contractors possess a wealth of untapped information and knowledge about what products would or would not make ideal multiyear contracting candidates. This applies to both major systems and other items bought on a regular basis throughout DoD. A more formalized method other than the occasional unsolicited proposal or the convening of a Defense Science Board needs to be found that could regularly surface these ideas and suggestions. A greater contractor voice in the selection process would aid competition and improve cost estimates. These thoughts have been expressed repeatedly by contractors throughout this survey.

5. Small Multiyear Cost and Price Wavier

This recommendation is not applicable to major systems but is instead a byproduct of the frustrations voiced by contractors and those in Government on the need to streamline and motivate behavior that is mutually beneficial. The future of multiyear contracting will not be made in major systems due to current and projected reductions in the Service's budgets. Its future will be in those programs below the major system designation but still comprising several million dollars. If a limit of $500,000 can be set for an annual year contract below which cost and pricing data will not be required, then a similar limit for multiyear should take into account its length of time. A five-year multiyear contract should provide for an exception of cost and pricing data up to $2.5 million. This would allow a greater use of multiyear for lower cost items.

6. Additional Multiyear Limitation

The responses from this survey and those in the research literature are consistent in showing the dramatic interaction of market conditions and product nature. Multiyear contracting's success or failure becomes a reflection of two key variables. These are the volume of an item to be produced and its susceptibility of unit pricing to increased market efficiencies.

The greater the number of units produced as well as the greater the cost of those units, the more a program can benefit from use of multiyear. The most successful multiyear contracts have been those that have had a great number of units produced and priced at levels which encourage investment in production equipment. There are numerous programs that can be cited as examples of this such as the UH-60A helicopter, the MK-46 torpedo, the F-16 fighter, and the M-1 laser range finder. All were high cost, high volume items produced in at

least several hundred quantities amenable to production efficiencies.

Another category of items that might benefit from multiyear are low cost items produced in very large quantities. Here the efficiencies gained per unit are small but the overall effect is dramatic cost savings. An example of a low cost high volume item successfully using multiyear contracting was the Navy's AN-SSQ-36 sonobuoy multiyear contract awarded in the mid-1980's. Here unit price was $163 on a volume of 31,000 units. Multiyear successfully influenced the price due to economies of scale from the large quantities produced whereas any smaller quantities would have made the use of multiyear impractical. [Ref. 26:p. 2]

Most multiyear problem contracts have occurred with low volume, high cost procurements. Prime examples are most shipbuilding contracts such as the original LHA-1 contract. Multiyear should be prohibited in these examples. Low volume work, no matter how expensive, does not appear to be amenable to achieving cost efficiencies. Although the Air Force has been able to successfully produce many low volume, high cost satellites under multiyear contracts, this may be the exception rather than the rule. Another contract type like multiyear but tailored to these programs is needed. This type might be called "no year" for lack of a better term to describe its most notable feature. A "no year" contract would span as many as ten years to accommodate special needs such as shipbuilding. It would have many of the same attributes as multiyear but not be held to the same strict demonstration of design stability and set savings percentages. Such a contract category requiring strict advance Congressional approval might better serve some use.

The last category, low volume, low cost, is not applicable to major systems. Logically, no one should want to use multiyear in these instances since its complexities

outweigh any advantages. Since it is not prohibited, it could still be tried with grave results.

Multiyear should be restricted only to the two categories that it is best suited for: high volume, high cost and high volume, low cost. Another form of multiyear should be created for low volume, high cost work. Low, volume, low cost should be prohibited from using multiyear.

7. Restrict Political Influence on Multiyear Candidates

Congress was repeatedly cited by both industry and Government program managers as a major source of problems in the selection of multiyear candidates. The candidates nominated by the Services are integral parts of a national strategic plan embodied in the FYDP. Military readiness should be above political squabbling. Yet, it is also unwise to try to restrict Congress from having a voice in safeguarding the interests of the People in ensuring their money is spent wisely. A nonpartisan commission, similar to the recent Base Realignment and Closure (BRAC) Commission, should make recommendations on major system candidates for multiyear contracting. This would eliminate most of the political pressure on the competition for program funding and ensure complementary integration with a national defense strategy.

D. SUGGESTIONS FOR FURTHER RESEARCH

There are many areas of research that need to be pursued to gain a fuller understanding of the forces that affect multiyear contracting. A few of these additional research topics follow.

1. Multiyear and Weighted Guidelines Profit Policy

As noted, contractors feel that the Weighted Guidelines do not adequately capture the true element of risk they undertake in a multiyear contract. Much of what there is in

the Weighted Guidelines on multiyear seems to be added as an afterthought. Research to rewrite and apply specific guidance for the application of Weighted Guidelines would do much to rectify contractor misgivings and produce a profit reflective of risk.

2. Multiyear Risk and FPIF Contracting

Surprisingly, the majority of multiyear contracts for major system acquisitions are firm-fixed-price contracts. If risks and potential benefits were as great as both parties seem to acknowledge, one would expect to see more fixed-price-incentive-firm contracts. A study of the decision process that results in what kind of multiyear contract is selected would cast additional light on risk.

3. Multiyear Contracting Barriers

There seems to be a great reluctance to use multiyear contracting at all levels of the DoD contracting community. An exploration of these reasons and how they might be overcome would do much to expand the process downward throughout all levels of Government contracting and not just for major systems acquisitions. While multiyear may not be right for all purchases, there should be a proper balance for repetitive purchases that can be achieved.

4. Cancellation Ceilings

The process used by the Government to determine the level of a cancellation ceiling evokes contractor anxiety. While the level of a cancellation ceiling is not related to investment decisions per se, it is related to risk evaluation which does have an influence on investment. The decision process in setting the ceiling may not be optimized to produce the level of savings possible from a multiyear contract. A study of the cancellation ceiling decision process may reveal areas for improvement.

5. Political Influence on Multiyear Major Systems

Clearly, politics plays a major role in the acquisition of major systems. The degree to which this is beneficial or harmful from a contractual point of view (and multiyear in particular) is a controversial issue. Research that compared the success of programs with and without political influence against the same set of variables such as design and requirements stability would make a fascinating study.

6. Survey Replication at Different Level

Many of the conclusions drawn from this study may only be peculiar to the major system acquisition environment. Many of the questions in this study could be repeated at a lower level of supply type contracts to see if conclusions about subcontracting and quality are still true. A pool of multiyear contracts for such a study could be identified by using the DD Form 350 coding on reports held by the Federal Procurement Data Center.

7. Multiyear Service Contracting

Little information exists on how the factors and influences discussed in this study might relate to multiyear service contracting when discounting those unique to major systems. The process for determining cancellation ceilings and profit could be compared and contrasted.

E. CHAPTER SUMMARY

This Chapter has examined the conclusions drawn from the data collected by this study. Data trends and significant differences were noted and discussed. Recommendations and areas for further inquiry were suggested.

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APPENDIX A. SUMMARY OF MULTIYEAR PROGRAMS 1985 TO 1991

FY 85 Multiyear Requests [Ref. 51]
Twelve requests of which Congress approved six
- UH/EH-60A Black Hawk Helicopter Airframe
- Defense Satellite Communications System (DSCS) III
- CH/MH-53E Helicopter Airframe
- M939 Series 5-ton Truck
- CH-47 Helicopter Modernization Program
- F-16 Airframe follow on

Disapproved FY 85
- TOW II Missile
- Bushmaster 25mm Gun
- M-2 Bradley Turret Drive
- AN/SSQ-36 Sonobouys
- F-16 Simulator
- Shop Equipment Contact Maintenance Vehicle (CMV)

FY 86 Multiyear Requests [Ref. 52]
Ten requests of which Congress approved seven
- MK-46 Torpedo
- T700 Series Engine
- LHD Amphibious Ship
- M1A1 Tank chassis
- M1A1 Tank engine
- M1A1 Tank Fire Control Components
- M-2 Bradley Fighting Vehicle Transmission

Disapproved FY 86
- P-3C Airframe
- M1A1 Ballistic Computer
- M9 Armored Combat Earthmover (ACE)

FY 87 Multiyear Requests [Ref. 53]
Nine requests of which Congress approved four
- Stinger Missile System
- Patriot Weapon System
- UH-60A Black Hawk Utility Helicopter Airframe
- Defense Support Program (DSP) satellites (TRW 647)

Disapproved FY 87
- AH-64A Apache Helicopter Airframe
- Target Acquisition Designation and Pilot Night Vision Sensor, (TADS/PNVSc)
- F/A-18 Strike Fighter Aircraft
- Mark 45 Gun Mount & Mk 6 Ammunition Hoist
- High Speed Anti-Radiation Missile (HARM)

FY 88 Multiyear Requests [Ref. 54]
Ten requests of which Congress approved four
- High Mobility Multipurpose Wheeled Vehicle (HMMWV)
- TOW-2 Missile
- Hawk Missile
- Heavy Expanded Mobility Tactical Truck (HEMTT)(added in committee, not at Service request)

Disapproved FY88
- AN/ALQ-136(V)2 Radar Jammer
- CH-47D Helicopter Modernization Program
- Harpoon Missile
- Defense Meteorological Satellite Program
- F-16 Airframe follow on
- Imaging Infrared Maverick Missile

FY 89 Multiyear Requests [Ref. 55]
Eight requests of which Congress approved seven
- H-60 Series Helo Engines (T700 Series Engine)
- CH-47 Helicopter Modernization Program
- Multiple Launch Rocket System (MLRS)
- AV-8B Aircraft
- UHF Follow on Satellite System (UFO)
- Defense Meteorological Satellite Program (DMSP 5D3)
- F-16 Airframe follow on

Disapproved
- AH-64 Helo (added in committee, not at Service request)

FY 90 Multiyear Requests [Ref. 40]
Eleven requests of which Congress approved seven
- Imaging Infrared Maverick Missile
- M1A1 Tank Fire Control System and Thermal Imaging System
- M1A1 Tank Chassis
- M1A1 Tank engine
- M-2 Bradley Fighting Vehicle Integration
- Palletized Load System (PLS)
- M-2 Bradley Fighting Vehicle TOW-2 Subsystem

Disapproved
- Combined Effects Munition (CEM)
- KC-135C Reengine Program
- F/A-18 Aircraft
- E-2C Aircraft

FY 91 Multiyear Requests [Ref. 15]
Six requests of which Congress approved six
- UH/EH-60A Black Hawk Helicopter Airframe
- FMTV (Family of Medium Tactical Vehicles)
- LHD Amphibious Ship
- Navstar Global Positioning System (GPS) Block II
- Avenger Weapon System
- LCAC

Disapproved: none

APPENDIX B. INTRODUCTION LETTER

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CA 93943-5100

Code: SGC 1968
26 August 1994

Dear :

I am an active duty Naval Officer assigned to the Naval Postgraduate School in Monterey, California conducting research in multiyear contracting. The object of my research is to investigate the concerns and suggestions industry might have with multiyear contracting so as to make it a more viable acquisition tool. My research is focused specifically on those major system acquisitions from 1985 to 1992 that were proposed to Congress by the Department of Defense as candidates for multiyear contracting. One of the questions I seek to resolve is whether those companies awarded a multiyear contract have benefitted to the degree expected.

Attached is a questionnaire developed to assess this and other questions. Please take time to complete the survey or pass it along to those within your organization who might be better able to do so. Complete as much of the survey as possible and return it in the envelope provided at your earliest convenience but no later than 23 September 1994.

Surveys are being mailed to both contractors and Government program offices to obtain both perspectives on multiyear contracting. In some instances contractors and Government program offices may receive two questionnaires for different aspects of the same major system. Please complete each and do not coordinate responses.

All responses will remain strictly confidential and under no circumstances will companies or program offices be specifically identified by name. Survey results will be used for academic analysis and the creation of recommendations for change to current multiyear procurement policies. If you so indicate, I will forward an executive summary to you in late December 1994.

I want to thank you in advance for your assistance. If you have any questions I can be reached at (408) 656-0819.

Sincerely,

Richard F. Gonzalez
LCDR, SC, USN

Encl.

APPENDIX C. MULTIYEAR QUESTIONNAIRE

LCDR Richard F. Gonzalez
Naval Postgraduate School
Code: SGC 1968
Monterey, CA 93943

SURVEY OF MULTIYEAR CONTRACTING FOR MAJOR SYSTEMS

This survey is designed to elicit responses on contractor business practices influenced by the use of multiyear contracting for Major Systems Acquisitions. It is being sent to both contractors and Government program offices to validate responses. Contractors and Government program offices should respond to as many questions as possible. Except for Sections I, II and VIII, some questions may not be readily answerable. Questions should be answered according to the most recently placed multiyear contract for the system mentioned if multiple contracts are involved. To enhance candid responses, identification of respondents in the final published analysis will not be revealed. Feel free to add or comment on any question either on the last page or by separate enclosure. Please mail the survey in the envelope provided no later than 23 September 1994.

A. This questionnaire is applicable to the following system:
_____

B. This system was proposed for multiyear contracting in fiscal year(s): _____

C. If you desire a summary of this report list your address:
_____

_____

_____

SECTION I: RESPONDENT BACKGROUND AND EXPERIENCE

B1. Select the answer that most nearly describes your position in your present organization:

a. Contracts/Procurement
b. Program Executive/Program Management
c. Business/Financial
d. Technical/Engineering
e. Other, please specify: _____

B2. How many years have you served or been exposed to this area within your present organization?

a. 1 year or less b. 1 to 3 years c. 3 to 5 years
d. 5 to 10 years e. over 10 years

B3. How many years have you worked with or been associated with a multiyear contract either in this or other acquisitions?

a. none b. 1 to 3 years c. 3 to 5 years
d. 5 to 10 years e. over 10 years

SECTION II: PROGRAM SELECTION

P1. Do you believe this major system was a good candidate for multiyear contracting?

a. Yes b. No

Why?_____

_____

_____

_____

P2. What do you believe was the reason for the identification of this major system for use of multiyear contracting?

_____

_____

_____

P3. Do you believe the principal reason above was achieved?

a. yes b. no

Please elaborate: _____

_____

_____

_____

P4. Major systems multiyear contract candidates are identified by each of the Armed Services with recommendations forwarded to Congress. After GAO investigates, Congress approves or disapproves them. Does this process serve the interests of both business and the Armed Services, one or the other, or neither?

_____

_____

_____

_____

_____

P5. Would a multiyear contract for this major system have provided greater protection against shifting political interests?

a. yes, strongly agree
b. yes, but only mildly agree
c. neutral/maybe
d. no, mildly disagree
e. no, strongly disagree

P6. Did political consideration play a part in identifying this program for multiyear contracting?

a. yes, strongly agree
b. yes, but only mildly agree
c. neutral/maybe
d. no, mildly disagree
e. no, strongly disagree

P7. Would a multiyear contract have provided protection against shifting budget considerations resulting in greater program stability?

a. yes, strongly agree
b. yes, but only mildly agree
c. neutral/maybe
d. no, mildly disagree
e. no, strongly agree

P8. If given an opportunity to place or receive a contract of the same type for the same major system, would you do so?

a. yes, but only if it involves a multiyear contract
b. yes, but only if it involves an annual year contract
c. yes, with either a multiyear or annual contract
d. no

If "d" please elaborate: _____

_____

_____

_____

P9. Did this program result in a multiyear contract?

a. yes. Please answer all remaining questions.
b. no. Please indicate the reasons a multiyear contract was not awarded. Answer only the additional questions in Section VIII and return the survey. Thank you for your participation.

_____

_____

_____

_____

SECTION III: FACILITIES AND INVESTMENT

F1. What was the approximate dollar level of investment in plant and equipment stimulated by this multiyear contract?

a. $_____

F2. Would contractor plant and equipment investment have been greater if this contract had been awarded as an annual contract instead of a multiyear contract?

a. yes, much more than expected
b. yes, slightly more than expected
c. no, about the same
d. no, less than expected

F3. Was amortization of start up costs and capital investment achieved to the degree desired by the contractor?

a. yes
b. yes, but with some reductions
c. no, but some benefits were achieved
d. no

F4. Does contractor provided plant and facilities/capital investments made for this multiyear contract still exist?

a. yes, in full
b. yes, but not in full
c. no, but with some residual capacity
d. no, it no longer exists

F5. What was the technological level of the contractor's production facilities at the end of the multiyear contract (MYC)?

a. greater than at the beginning due to MYC
b. greater than at the beginning but not due to MYC
c. about the same
d. less than at the beginning but not due to MYC
e. less than at the beginning due to MYC

F6. Did this multiyear contract contribute to the preservation of the defense industrial base?

a. yes, it had a major impact
b. yes, in some small way
c. maybe
d. no, not really; it had only a negligible impact
e. no, not in the least bit

Please elaborate: _____

_____

_____

F7. Did a large cancellation ceiling in this multiyear contract tend to greatly expand plant investment?

a. yes, it greatly expanded investment by reducing risk
b. yes, but it only expanded slightly due to other unknown risk factors
c. no, it had little or no impact
d. no, it had the opposite impact because too much capital would have been put at risk for too long

SECTION IV: PROGRAM STABILITY

S1. How stable was the design of the item(s) under multiyear contract?

a. very stable, no Engineering Change Proposals (ECPs) were submitted
b. fairly stable, few if any ECPs submitted
c. stable; ECPs submitted but had only a minor impact on contractor manufacturing and buying practices
d. not stable, several ECPs submitted had a direct impact on manufacturing and buying practices
e. unstable, many ECPs submitted which had a direct impact on manufacturing, buying practices and other costs

S2. Did ECPs result in material being scrapped thereby increasing contract costs?

a. yes, it happened quite frequently
b. yes, but it happened rarely
c. no, it happened but costs were absorbed elsewhere
d. no, there were no ECPs that increased material costs

S3. If material were scrapped due to ECPs, what was the estimated dollar value involved?

a. $ _____ b. As a percent of total costs? _____ %

S4. Who initiated the majority of Engineering Change Proposals?

a. the Government
b. primarily the Government
c. both the contractor and the Government equally
d. primarily the contractor
e. the contractor

S5. Did the delivery schedule for this program get "stretched out?"

a. yes, and the reason rests primarily with the Government
b. yes, and the reason rests with both parties
c. yes, and the reason rests primarily with the contractor
d. no, but there were some minor delays
e. no, the program kept to its timetable

If "yes" elaborate on the reason and any impact on the execution of the multiyear contract:_____

_____

_____

_____

_____

SECTION V: SUBCONTRACTOR PARTICIPATION

K1. Did this multiyear contract result in greater subcontractor interest and competition than a similar annual contract award?

a. yes, greater than expected
b. yes, but only a bit more than average
c. no, the same amount as an annual contract
d. no, less than an annual contract

Please speculate on the reasons why: _____

_____

_____

K2. Were the criteria for awarding subcontracts on this multiyear contract different from a similar annual year contract?

a. yes, entirely different
b. yes, but only a little different
c. no, essentially the same

If "yes" please elaborate: _____

_____

_____

K3. Did it take longer to award subcontracts on this multiyear contract compared to a similar annual contract award?

a. yes, longer than expected
b. yes, but only a bit longer than average
c. no, the same time as an annual contract
d. no, faster than an annual contract

Please speculate on the reasons why: _____

_____

_____

K4. Were subcontractor management and monitoring costs per year greater than a comparable annual contract?

a. yes, greater than expected
b. yes, but only a bit more than average
c. no, the same level as an annual contract
d. no, fewer than an annual contract

Please speculate on the reasons why: _____

_____

_____

K5. Were multiyear contracts with subcontractors considered?

a. yes, and many were placed
b. yes, but only a few were awarded
c. yes, but the risk was too great so none were awarded
d. no, it was not considered

K6. Was subcontractor quality on this multiyear contract better than expected on a comparable annual contract?

a. yes, much greater than expected
b. yes, but only slightly better than an annual contract
c. no, the same level as an annual contract
d. no, worse than an annual contract

Please speculate as to the reasons why: _____

_____

K7. Were new subcontractor sources of supply developed for this contract not previously available under an annual contract?

a. yes, many new sources were developed
b. yes, a few new sources were developed
c. no, the same sources were used as an annual contract
d. no, fewer sources were used than an annual contract

K8. Approximately what percentage of these new sources of supply are still doing business with the prime contractor?

_____ %

K9. What dollar percentage was subcontracted out?

_____ %

K10. What dollar percentage (if any) of subcontracts were awarded on a multiyear basis?

_____ %

SECTION VI: CONDUCT OF THE CONTRACT

Indicate agreement or disagreement with the following questions:

C1. Compared to a similar annual year contract, this multiyear contract allowed the contractor a greater retention of critical and highly trained personnel?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C2. Compared to a similar annual year contract, this multiyear contract achieved technological advances for the contractor that granted him a competitive edge?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C3. Compared to a similar annual year contract, this multiyear contract provided the contractor an opportunity for greater profit?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C4. Compared to a similar annual year contract, this multiyear contract increased contract administration burden on the contractor?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C5. Compared to a similar annual year contract, this multiyear contract increased the effectiveness of contractor long range planning for this major system?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C6. Compared to a similar annual year contract, this multiyear contract increased contractor standardization of parts and manufacturing routines?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C7. Compared to a similar annual year contract, this multiyear contract increased the capacity to surge production during a national crisis if additional items of this kind were needed?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C8. Compared to a similar annual year contract, this multiyear contract increased contractor productivity?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C9. Compared to a similar annual year contract, this multiyear contract increased or enhanced the quality of the final product?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C10. Compared with a similar annual year contract, this multiyear contract achieved significant cost avoidance and or cost savings for the contractor?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C11. Compared with a similar annual year contract, this multiyear contract resulted in a greater expenditure of contractor management time and overhead burden?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C12. Compared with a similar annual year contract, this multiyear contract altered established production routines and priorities, as well as the previous work packages for the contractor?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C13. Compared to a similar annual year contract, this multiyear contract altered contract financing for the contractor?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

C14. If savings were achieved on this multiyear contract what was the approximate source of the savings?

a. inflation/cost growth avoidance _____
b. better vendor prices _____
c. manufacturing economies/learning curve _____
d. other _____
all the above to equal 100%

C15. What was the final contract length in years? _____

SECTION VII: RISK

R1. What type of final contract form (other than multiyear) was negotiated (example: firm-fixed-price)?

a. _____

R2. Did the termination liability funding/cancellation ceiling price accurately reflect contractor risk?

a. yes, greater than what was expected
b. yes, but only a bit greater than what it was
c. yes, it was accurately reflected
d. no, the risk was slightly higher
e. no, the risk was much greater

R3. Was the negotiated profit greater than a similar number of annual year contracts would have been?

a. yes, greater than what was expected
b. yes, but only a bit greater than what was projected
c. no, it was right on target
d. no, it was slightly lower than expected
e. no, it was much lower than expected

R4. Did the DD Form 1547 (Weighted Guidelines) adequately reflect or evaluate contractor risk for this multiyear contract?

a. yes, but risk was greater than an annual year contract
b. yes, but risk was slightly greater
c. no, but it was about the same as an annual year contract
d. no, much less risky than an annual year contract
Please elaborate: _____

_____

R5. Was profit risk caused by escalation in interests rates adequately addressed by terms of the contract?

a. yes
b. yes, but not completely or to the degree desired
c. no, but there was some protection
d. no

R6. Was the negotiation strategy used for this multiyear contract different from that which would have been used for an annual year contract?

a. yes, much different than an annual year contract
b. yes, but only slightly different
c. no, about the same
d. no, much easier than an annual year contract
Please elaborate: _____

_____

R7. The length of this multiyear contract was not related in any way to program risk?

a. strongly agree
b. mildly agree
c. neutral/maybe
d. mildly disagree
e. strongly disagree

SECTION VIII WRITTEN COMMENTS

W1. What do you see as the single most urgent item in need of change to encourage the expanded use of multiyear contracting for major systems acquisitions?

W2. What changes in commercial business practices do you see multiyear contracting exerting or influencing?

W3. What (if any) do you feel are the principal benefits of multiyear contracting for contractors?

W4. Since the 1980's there has been a reduction in the use of multiyear contracting. What do you think accounts for this?

W5. Please comment on any aspect of multiyear contracting you feel not adequately covered. Thank you for your participation.

APPENDIX D. PROGRAM ADDRESSES AND POINTS OF CONTACT

TACOM (Army Tank-Automotive Command)

1. M939 Series 5 ton truck FY 85
   Mr. Richard McKaig
   Vice President of Contracts
   BMY-Wheeled Vehicle Div of HARSCO Corp
   13311 Industrial Parkway
   Marysville, OH 43040
   (513) 644-0041 VP of Contracts, Richard McKaig,
   Ext. 206
   Dave Franklin, Ext. 374 or Ruth Ann Thomas, Ext. 466

   Commander
   U.S. Army Tank Automotive Command (TACOM)
   Carl Brobeil
   ATTN: AMSTA-WE
   Warren, MI 48397-5000
   (810) 574-6335 A/V 786-6335

2. M1A1 Tank chassis FY 86, 89, 90
   Mr. Howard Roberts
   Vice President of Program Review & Analysis
   General Dynamics
   P.O. Box 2074
   Warren MI 48090-2074
   (810) 825-7920

   PEO ASM
   COL C. Cardine, Program Manager
   ATTN: SFAE-ASM-AB
   Warren, MI 48397-5000
   (810) 574-6885

3. M1A1 Tank engine FY 86, 90
   Textron Lycoming Stratford Division
   ATTN: Mr. Dave Coventry
   550 Main St
   Stratford, CT 06497
   (203) 385-2701 POC: VP Engine Programs

   PEO ASM
   COL C. Cardine, Program Manager
   ATTN: SFAE-ASM-AB
   Warren, MI 48397-5000
   (810) 574-6885

4. M1A1 Tank Fire Control Components FY 86
   Mr. Robert P. Klaver, Program Manager
   Hughes Aerospace & Electronics Co.
   P.O. Box 902
   EOS
   E.O./EO4/N147
   El Segundo, CA 90245
   (310) 616-9764

   PEO ASM
   COL C. Cardine, Program Manager
   ATTN: SFAE-ASM-AB
   Warren, MI 48397-5000
   (810) 574-6885

5. M-2 Bradley Fighting Vehicle Transmission FY 86, 90
   General Motors
   Allison Transmission Division
   ATTN: Mr. Dave Spikes
   P.O. Box 894
   Indianapolis, IN 46206
   (317) 242-6604

   PEO ASM
   COL Dennis Deming, Project Manager
   ATTN: SFAE-ASM-BV
   Warren, MI 48397-5000
   (810) 574-5630 - COL Dennis Deming, Project Manager
   (810) 574-7644 - LTCOL James Adams, Product Manager

6. M-2 Bradley Fighting Vehicle integration FY 90
   FMC Corporation
   United Defense LP
   Ground Systems Div
   Attn: Mr Pete Waglin
   P.O. Box 58123, Z32
   Santa Clara, CA 95052
   (408) 289-3271

   PEO ASM
   COL Dennis Deming, Project Manager
   ATTN: SFAE-ASM-BV
   Warren, MI 48397-5000
   (810) 574-5630 - COL Dennis Deming, Project Manager
   (810) 574-7644 - LTCOL James Adams, Product Manager

7. High Mobility Multipurpose Wheeled Vehicle(HMMWV) FY 88
AM General Corp
ATTN: Mr. Ed Peters
105 N. Niles Ave
P.O. Box 7025
South Bend, IN 46634-7025
(219) 284-2837

Commander
U.S. Army Tank Automotive Command
Mr. John Weaver, Program Manager
ATTN: SFAE-TWV-SP
Warren, MI 48397-5000
(810) 574-6710 Doug Phillips is the Weapon Systems Manager and J. Weaver is the Program Manager for Tactical Wheel Vehicles.

8. Heavy Expanded Mobility Tactical Truck (HEMTT) FY 88
Oshkosh Truck Corp
ATTN: Mr. Scott Negendank
P.O. Box 2566
Oshkosh, WI 54903-2566
(414) 235-9150

PEO ASM
COL James Wank, Project Manager
ATTN: SFAE-TWV-PLS
Warren, MI 48397-5000
(810) 574-5800

9. Family of Medium Tactical Vehicles (FMTV) FY 91
Stewart and Stevenson Services, Inc
LaRoy Hammer, Group Vice President
P.O. Box 330
Cealy, TX 77474
(713) 867-1430

Commander
U.S. Army Tank-Automotive Command (TACOM)
Mr. Tom Franquist
ATTN: SFAE-TWV-FMTV
Warren, MI 48397-5000
(810) 574-5443

10. Palletized Load System (PLS) FY 90
    Oshkosh Truck Corp
    ATTN: Mr. Lloyd Rank
    P.O. Box 2566
    Oshkosh, WI 54903-2566
    (414) 235-9150

    Commander
    U.S. Army Tank-Automotive Command (TACOM)
    Mr. Dan Herrera, Weapon Systems Manager
    ATTN: SFAE-TWV-PLS
    Warren, MI 48397-5000
    (810) 574-5220

Air Force Aeronautical Systems Command

1. F-16 airframe FY 85, 89
    Mr. Frank Riney
    Vice President of Contracts, M.Z. 1108
    Lockheed Fort Worth Company
    P.O. Box 748
    Fort Worth, TX 76101-0748
    (817) 777-4140

    COL Leslie F. Kenne - Program Director
    Air Force Aeronautical Systems Command
    ASC\YP
    Bldg 12
    1981 Monahan Way
    Wright-Patterson AFB, OH 45433-7205
    (513) 255-6151 A/V 785

2. Maverick (Imaging Infrared Maverick Missile) FY 90
    Mr. A. M. Aronowitz
    Hughes Missile System Co.
    PO Box 11337
    Bldg 807/C8
    Tucson, AZ 85734
    (602) 794-1919

    OO-ALC/LIWDM
    LTCOL Gallagher - Project Manager
    6034 Dogwood Avenue
    Hill AFB, UT 84056-5816
    (801) 777-5226/5266

NAVSEA (Naval Sea Systems Command)

1. LHD amphibious ship FY 86, 91
   Mr. J. T. Savage, Manager LHD
   Ingalls Shipbuilding Inc.
   P.O. Box 149
   Pascagoula, MS 39567-0149
   (601) 935-4326

   Department of the Navy
   Naval Sea Systems Command
   Mr. Robert Bennett - Acquisition Manager
   PMS-377R
   2531 Jefferson Davis Highway
   Arlington, VA 22242-5160
   (703) 602-7812

2. Mk-46 Torpedo FY 86
   Alliant Techsystems
   Mr. Dennis Bowman (WA34-3D12)
   6500 Harbor Heights Parkway
   Mukilteo, Washington 98275
   (206) 356-3159

   Department of the Navy
   Program Executive Officer
   Undersea Warfare
   CAPT Davis
   Attn: PMO-402
   2531 Jefferson Davis Highway
   Arlington, VA 22242-5169
   (703) 602-0610

3. LCAC (Light Cushion Air Craft) FY 91
   Textron Marina & Land Systems
   ATTN: Mr. Eckman, LCAC Program Director
   6600 Plaza Drive
   New Orleans, LA 70127
   (504) 245-6805 INFO # (504) 245-6600

   Department of the Navy
   NAVSEA
   Mr. Richard Kenefic, Acquisition Manager
   PMS-377J
   2531 Jefferson Davis Highway
   Arlington, VA 22242-5160
   (703) 602-8515

MICOM (Army Missile Command)

1. Stinger Weapon System FY 87
   Ms. Mary Rowe
   M/S E25
   Hughes Missile System Co.
   P.O. Box 11337
   Bldg. 801
   Tucson, AZ 85734
   (602) 794-1618

   COL Daniel M. Prescott, Project Manager
   Forward Area Air Defense
   ATTN: SFAE-MSL-FAD
   Redstone Arsenal, AL 35898-5630
   (205) 876-4927

2. Patriot Weapon System FY 87
   Raytheon Company
   Missile Systems Division
   ATTN: Mr. Steve Stanvick, S2SA13
   Hartwell Road
   Bedford, MA 01730
   (617) 274-4504 Manager Patriot Program

   COL Frank Powell, Project Manager
   PEO Missile Defense
   ATTN: SFAE-MD-PA
   PO Box 1500
   Huntsville, AL 35807-3801
   (205) 955-3240

3. TOW-2 missile FY 88, 89
   Mr. A. M. Aronowitz
   Hughes Missile System Co.
   P.O. Box 11337
   Bldg 807/C8
   Tucson, AZ 85734
   (602) 794-1919

   COL Robert Armbruster, Project Manager
   CCAWS Project Office
   ATTN: SFAE-MSL-CC
   Redstone Arsenal, AL 35898-5710
   (205) 876-7194 A/V 246

4. Hawk Missile FY 88
   Mr. Carl H. Guild, Jr.
   Raytheon Engineers & Constructors, Inc.
   141 Spring Street
   Lexington, MA 02173
   (617) 860-3411

   Commander
   U.S. Army Missile Command (MICOM)
   ATTN: AMSMI-WS-HA/Roger Comer
   Redstone Arsenal, AL 35898-5660
   (205) 876-4715 A/V 246

5. Multiple Launch Rocket System (MLRS) FY 89
   Mr. C. H. McKinley (MC-25)
   Vice President Fire Support Programs
   P.O. Box 650003
   Dallas, TX 75265
   (214) 603-7136 (Closed on Fridays)

   MLRS Project Office
   COL William S. Taylor, Project Officer
   ATTN: SFAE-MSL-ML
   Redstone Arsenal, AL 35898-5700
   (205) 876-1195 A/V 246-1195

6. Avenger Weapon System FY 91
   Boeing Company
   ATTN: Mr. Ross Dessert M/S JN01
   PO Box 240002
   Huntsville, AL 35824-6402
   (205) 461-3261

   Project Manager
   Forward Area Air Defense
   COL Daniel M. Prescott, Project Manager
   ATTN: SFAE-MSL-FAD
   Redstone Arsenal, AL 35898-5630
   (205) 876-4927 A/V 746-4927

AVSCOM (Army Aviation and Troop Command)

1. UH/EH-60 Blackhawk Helo FY 85, 87, 91
   Mr. Arthur J. O'Leary
   Vice President (Mail Stop S623A)
   Sikorsky Aircraft
   6900 Main Street
   Stratford, CT 06601-1381
   VP of H60 Programs, (203) 386-4488

   Project Manager Utility Helicopters
   COL Chester Reese, Project Manager
   ATTN: SFAE-AV-BH
   4300 Goodfellow Blvd
   St. Louis, MO 63120-1798
   (314) 263-1700 A/V 693-1700

2. CH-47 Helo modernization FY 85, 89
   Mr. Derek Hart, M/S P30-05
   Program Manager CH-47
   Boeing Defense & Space Group
   Helicopter Division
   P.O. Box 16858
   Philadelphia, PA 19142-0858
   (610) 591-8663

   Project Manager CH-47 Modernization Program
   LTCOL Paul A. Dvorsky, Project Manager
   ATTN: SFAE-AV-CH
   4300 Goodfellow Blvd
   St. Louis, MO 63120-1798
   (314) 263-1411 A/V 963-1411

3. T700 General Electric engine (H-60 helo) FY 86, 89
   Mr. Richard Willis (M/S 24017)
   General Electric Aircraft Engines
   1000 Western Ave
   Lynn, MA 01910
   (617) 594-1612
   Add'l POC: DPRO Joe Dynan (617) 594-3141 and Ken Cormier Program Manager (617) 594-1706.

   Project Manager Utility Helicopters
   ATTN: COL Chester Reese
   SFAE-AV-BH
   4300 Goodfellow Blvd
   St. Louis, MO 63120-1798
   (314) 263-1700 A/V 693-1700

4. AH-64 Apache Helo FY 89
McDonnell Douglas Helicopter Systems
M/S 510-A233
5000 East McDowell Road
Mesa, AZ 85215
(602) 891-3000 VP AH-64 Programs, Ervin J. Hunter
(602) 891-5353

Program Manager Advance Helicopters
Mr. Gary S. Nenninger
ATTN: SFAE-AV-AAH
4300 Goodfellow Blvd
St. Louis, MO 63120
(314) 263-1911 A/V 693-1911

NAVAIR (Naval Air Systems Command)

1. CH/MH-53 Helo airframe FY 85
Mr. Mike Blake
Director M/S (S621A)
Sikorsky Aircraft
6900 Main Street
Stratford, CT 06601-1381
(203) 386-3612

Program Executive Officer
Air ASW Assault & Special Mission Program (PMA-261)
Thomas Laux, Program Manager
1421 Jefferson Davis Highway
Arlington, VA 22243
(703) 604-2274 Ext. 7059

2. AV-8B Harrier aircraft FY 89
Mr. James Korte
Mail Code 1063088
Program Manager International Programs
McDonnell Douglas Aerospace
PO Box 516
St. Louis, MO 63166
(314) 232-6610

Program Executive Officer
PMA-257
1421 Jefferson Davis Highway
Arlington, VA 22243-1257
(703) 604-2238 x7134 POC: COL Richard Priest

Air Force Space Command

1. DSCS III, Defense Satellite Communications System FY 85
   Mr. Donald B. Chasteen
   Vice President Business Management
   Martin Marietta Astronautics Group
   P.O. Box 179
   Denver, CO 80201
   (303) 977-3368

   COL Grant
   SMC/MCD
   2420 Vela Way
   Suite 1467
   Los Angeles AFB, CA 90245-4659
   (310) 336-4683

2. DSP, Defense Support Program (TRW program) FY 87
   TRW Incorporated
   Space & Technology Group
   One Space Park, Bldg R5180
   Redondo Beach, CA 90278
   (310) 813-9044 ATTN: Dr Burnette or (310) 814-6195
   Elliot Bailis

   Space Division
   Air Force Systems Command
   P.O. Box 92960
   Los Angles, CA 9009-2960
   Attn: LtCol Cruise
   (310) 363-1177

3. Defense Meteorological Satellite Program (DMSP 5D3)
   FY 89
   Martin Marietta Astronautics Group
   Mr. Donald B. Chasteen
   Vice President Business Management
   P.O. Box 179
   Denver, CO 80201
   (303) 977-3368

   SMC/CI
   ATTN: COL John Goyette
   2420 Vela Way
   Suite 1467 - A8
   Los Angeles AFB, CA 90245-4659
   (310) 336-4333

4. GPS Block III, NAVSTAR Global Positioning System Satellite FY 91
   Mr. Edward Morgan
   Vice President Defense Programs
   Martin Marietta Astro Space
   P.O. Box 8555
   Room U3040
   Philadelphia, PA 19101
   (610) 354-2805

   COL Widdemer
   SMC/CZ
   2435 Vela Way
   Suite 1613
   Los Angeles AFB, CA 90245-5500
   (310) 363-1526

SPAWAR (Naval Space Warfare Command)

1. UHF Follow on Satellite System (UFO) FY 89
   Mr. Ronald Swanson
   Hughes Aircraft Space & Communications
   Bldg S10, M/S S370
   P.O. Box 92919
   Los Angeles, CA 90009
   (310) 416-5742 or Mike Chisham, Contract Manager,
   (310) 416-5688

   Mr Dick Coffman
   PEO for Space Communications Sensors
   Code PMW 146
   5 Crystal Park
   2451 Crystal Drive
   Arlington, VA 22245-5200
   (703) 602-2879
   Dorothy Dean, Contracting Officer (703) 602-0867
   Dick Coffman, Program Mgr (703) 602-2879

APPENDIX E. MULTIYEAR POLICY STATEMENTS

DoD Policy Memorandum on Multiyear Procurement, 1 May 1981

1. Benefit to the Government. A multiyear procurement should yield substantial cost avoidance or other benefits when compared to conventional annual year contracting methods. MYP structures with greater risk to the Government should demonstrate increased cost avoidance or other benefits over those with lower risk. Savings can be defined as significant in terms of dollars or percentage of total costs.

2. Stability of Requirement. The minimum need for the production item or service is expected to remain unchanged or vary slightly during the contemplated contract period in terms of production rate, fiscal year phasing, and total quantities.

3. Stability of Funding. There should be a reasonable expectation that the program is likely to be funded at the required level throughout the contract period.

4. Stable Configuration. The item should be technologically mature, have completed RDT&E (including development testing or equivalent) with relatively few changes in item design anticipated and underlying technology should be stable. This does not mean that changes will not occur but that the estimated cost of such changes is not anticipated to drive total costs beyond the proposed funding profile.

5. Degree of Cost Confidence. There should be a reasonable assurance that cost estimates for both contract and anticipated cost avoidance are realistic. Estimates should be based on prior cost history for the same or similar items or proven cost estimating techniques.

6. Degree of Confidence in Contractor Capability. There should be confidence that the potential contractor(s) can perform adequately, both in terms of Government furnished items and their firm's capabilities. Potential contractors need not necessarily have previously produced the item.

Multiyear Contracting Criteria, FAR 17.103

1. The use of such a contract will result in reduced total costs under the contract.

2. The minimum need for the item to be purchased is expected to remain substantially unchanged during the contemplated contract period in terms of production rate, acquisition rate, and total quantities.

3. There is a reasonable expectation that throughout the contemplated contract period the department or agency will request funding for the contract at the level required to avoid contract cancellation.

4. There is a stable design for the item to be acquired and the technical risks associated with such items are not excessive.

5. The estimates of both the cost of the contract and the anticipated cost avoidance through the use of a multiyear contract are realistic.

APPENDIX F. RAW DATA

The following is the raw data collected by the questionnaire used in this study.

	Contractor Responses	Government Responses
SECTION I RESPONDENT BACKGROUND		
B1.	a.05 b.08 c.00 d.00 e.01	a.04 b.08 c.01 d.01 e.00
B2.	a.00 b.00 c.01 d.06 e.07	a.00 b.01 c.02 d.04 e.07
B3.	a.00 b.00 c.05 d.05 e.04	a.00 b.01 c.03 d.05 e.05
SECTION II PROGRAM SELECTION		
P1.	a.13 b.01	a.14 b.00
P2.	see text	see text
P3.	a.13 b.01	a.14 b.00
P4.	see text	see text
P5.	a.05 b.08 c.00 d.00 e.01	a.08 b.05 c.01 d.00 e.00
P6.	a.02 b.04 c.04 d.02 e.02	a.01 b.06 c.04 d.00 e.03
P7.	a.09 b.05 c.00 d.00 e.00	a.08 b.05 c.00 d.00 e.01
P8.	a.04 b.00 c.10 d.00	a.06 b.00 c.07 d.01
P9.	a.14 b.00	a.14 b.00
SECTION III FACILITIES AND INVESTMENT		
F1.	see text	see text
F2.	a.01 b.01 c.07 d.05	a.01 b.00 c.09 d.04
F3.	a.07 b.04 c.01 d.00 uk.2	a.07 b.05 c.00 d.00 uk.2
F4.	a.11 b.03 c.00 d.00	a.11 b.01 c.01 d.00
F5.	a.05 b.05 c.03 d.01 e.00	a.03 b.04 c.07 d.00 e.00

F6.	a.09 b.03 c.01 d.01 e.00	a.03 b.08 c.01 d.02 e.00
F7.	a.01 b.01 c.10 d.01 uk.1	a.02 b.03 c.07 d.00 uk.2

SECTION IV PROGRAM STABILITY

S1.	a.01 b.04 c.06 d.03 e.00	a.00 b.05 c.08 d.00 e.01
S2.	a.00 b.08 c.03 d.03	a.01 b.02 c.09 d.02
S3.	see text	see text
S4.	a.01 b.01 c.04 d.06 e.02	a.00 b.00 c.08 d.05 e.01
S5.	a.02 b.04 c.00 d.00 e.08	a.01 b.03 c.02 d.01 e.07

SECTION V SUBCONTRACTOR PARTICIPATION

K1.	a.09 b.03 c.02 d.00 uk.0	a.06 b.06 c.00 d.00 uk.2
K2.	a.03 b.06 c.05 uk.0	a.04 b.03 c.05 uk.2
K3.	a.03 b.03 c.07 d.01 uk.0	a.02 b.03 c.03 d.02 uk.4
K4.	a.00 b.01 c.05 d.08 uk.0	a.00 b.01 c.05 d.05 uk.3
K5.	a.13 b.01 c.00 d.00 uk.0	a.07 b.01 c.00 d.01 uk.5
K6.	a.01 b.04 c.09 d.00 uk.0	a.02 b.04 c.06 d.00 uk.2
K7.	a.01 b.08 c.05 d.00 uk.0	a.00 b.09 c.03 d.00 uk.2
K8.	see text	see text
K9.	see text	see text
K10.	see text	see text

SECTION VI CONDUCT OF THE CONTRACT

C1.	a.06 b.05 c.03 d.00 e.00	a.11 b.03 c.00 d.00 e.00
C2.	a.04 b.03 c.04 d.03 e.00	a.03 b.03 c.06 d.01 e.01
C3.	a.04 b.03 c.03 d.03 e.01	a.02 b.06 c.04 d.01 e.01

C4.	a.01 b.01 c.02 d.05 e.05	a.00 b.04 c.02 d.03 e.04
C5.	a.12 b.02 c.00 d.00 e.00	a.11 b.03 c.00 d.00 e.00
C6.	a.08 b.04 c.02 d.00 e.00	a.09 b.04 c.01 d.00 e.00
C7.	a.10 b.02 c.02 d.00 e.00	a.08 b.03 c.02 d.01 e.00
C8.	a.09 b.04 c.01 d.00 e.00	a.07 b.06 c.00 d.01 e.00
C9.	a.04 b.04 c.06 d.00 e.00	a.06 b.05 c.02 d.01 e.00
C10.	a.10 b.03 c.00 d.01 e.00	a.07 b.05 c.01 d.01 e.00
C11.	a.00 b.01 c.03 d.05 e.05	a.00 b.02 c.02 d.05 e.05
C12.	a.04 b.04 c.03 d.00 e.03	a.02 b.03 c.04 d.02 e.03
C13	a.04 b.03 c.05 d.00 e.02	a.05 b.03 c.01 d.01 e.02 uk.02
C14.	see text	see text
C15.	see text	see text

SECTION VII RISK

R1.	see text	see text
R2.	a.00 b.00 c.07 d.02 e.05	a.00 b.01 c.06 d.03 e.03 uk.01
R3.	a.00 b.05 c.05 d.01 e.03	a.00 b.00 c.09 d.04 e.00 uk.01
R4.	a.01 b.03 c.10 d.00 na.0	a.03 b.03 c.05 d.00 na.3
R5.	a.04 b.02 c.04 d.02 na.2	a.07 b.01 c.02 d.02 na.2
R6.	a.06 b.04 c.04 d.00 uk.0	a.04 b.04 c.04 d.00 uk.2
R7.	a.01 b.03 c.02 d.05 e.03	a.01 b.08 c.01 d.00 e.04

SECTION VIII MISCELLANEOUS

W1. to W5. see text

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